National SAFETY NEWS

AUGUST 1956

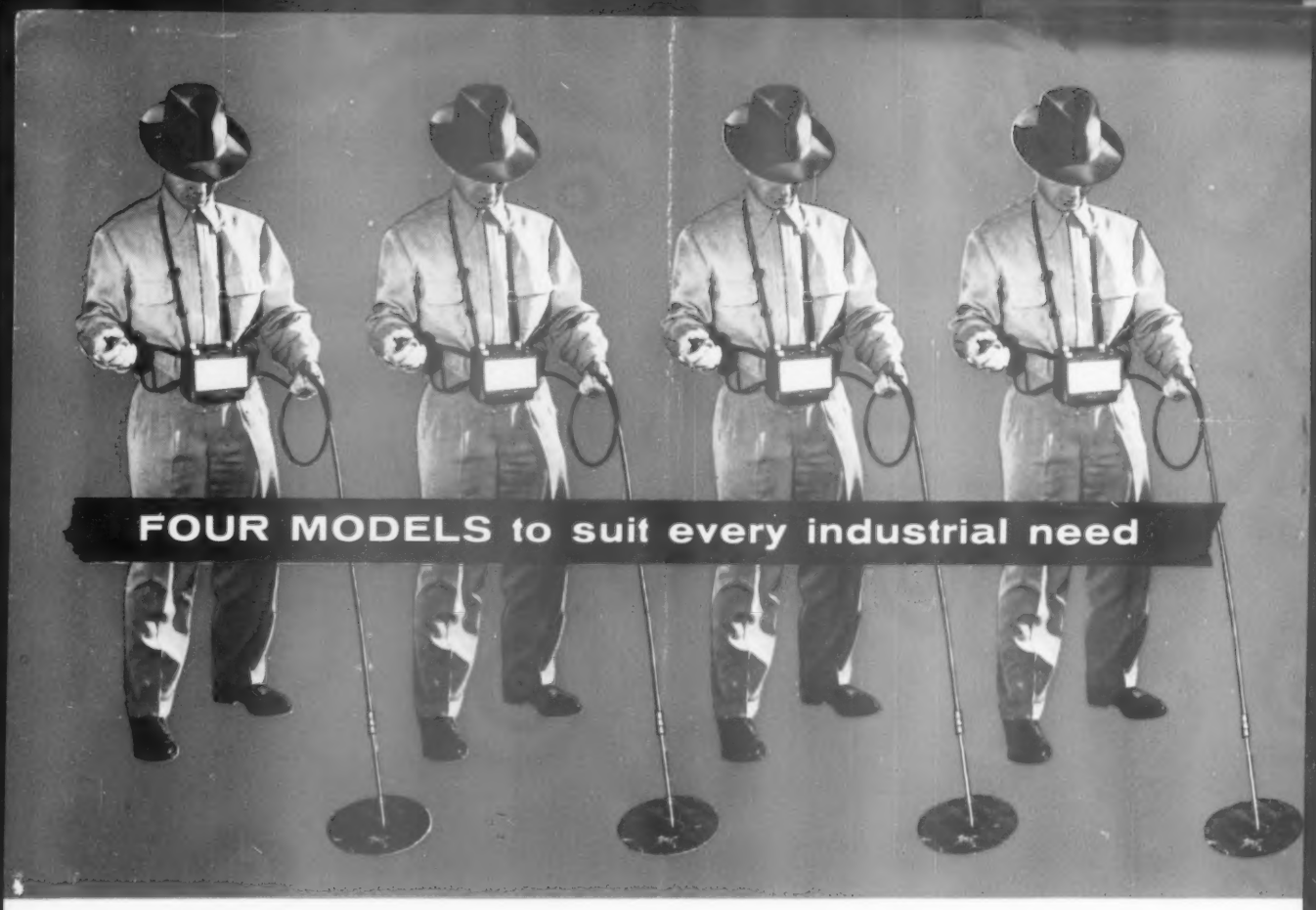
This issue contains a special Technical Feature Section

The Journal of the AMERICAN SOCIETY OF SAFETY ENGINEERS

PROVING GROUND FOR A SAFETY PROGRAM

IN THIS ISSUE

A Shared Responsibility
The Awards Followed
Better Vision in Your Plant



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National SAFETY NEWS

Published monthly by National Safety Council

Containing a special Technical Feature Section

The Journal of the AMERICAN SOCIETY OF SAFETY ENGINEERS

Vol. 74, No. 2 AUGUST 1956

THE COVER: In the hazardous pulp and paper operations on the Pacific Coast, management and labor have been working together to bring down accident rates. Here a giant Berger crane is about to grab a heavy "asparagus bundle" of logs for Camas Mill of Crown Zellerbach Corporation.

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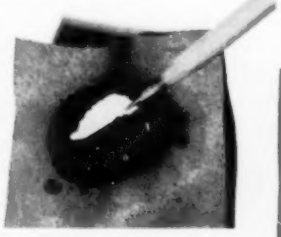


UNTREATED LEATHER —burnt through after some exposure.

Lehigh
SAFETY SHOE COMPANY
Emmaus, Pa.

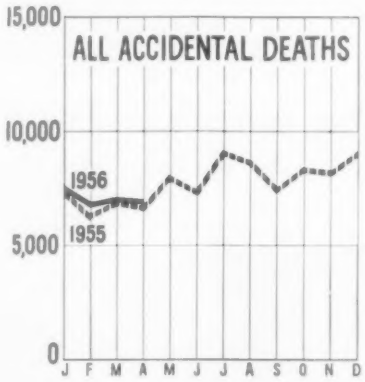
THE ACCIDENT BAROMETER

Prepared by the Statistics Division,

National Safety Council

ACCIDENTAL DEATHS in April totalled approximately 6,900, an increase of 5 per cent over April a year ago. Most of the increase occurred in deaths from motor-vehicle accidents, but fatalities from home accidents also were up. Deaths from work and public non-motor-vehicle accidents numbered about the same as in April, 1955.

The four-month death total was 27,900, an increase of 3 per cent over a year ago. There were increases in motor-vehicle and public non-motor-vehicle fatalities and decreases in work and home accident deaths.



	1956	1955	Change
April	6,900	6,600	+5%
Four Months	27,900	27,100	+3%

Motor-Vehicle Deaths

The motor-vehicle death total in April was 2,960, an increase of 8 per cent over last year. Compared to 1954, it was an increase of 14 per cent.

The death total for four months was 11,550, a 10 per cent increase over last year. The four-month death rate per 100,000,000 vehicle miles was 5.9, an increase of 3 per cent over the 1955 comparable rate of 5.7.

Of the 46 states reporting for four months, 17 had fewer deaths than last year, 2 had the same number and 27 had increases. Reporting cities with populations of more than 10,000 had a decrease of 4 per cent for April, but an increase of 7 per cent for the first four months of the year.

Regional changes from 1955 in the four-month death totals were:

North Atlantic	+ 9%
South Atlantic	+11%
North Central	+ 5%
South Central	+12%
Mountain	+18%
Pacific	+21%

Home Deaths

Home accident fatalities in April numbered about 2,100, or 100 more than last year.

The total for four months was 9,200, a decrease of 2 per cent from 1955. Most of the reduction occurred in deaths from poisonings and firearms accidents but deaths from falls and mechanical suffocation also were fewer. There were moderate reductions in deaths of young people 15 to 24 and persons 45 to 64 years old and small decreases in deaths of children under 5 and persons 65 years and over.

Work Accidents

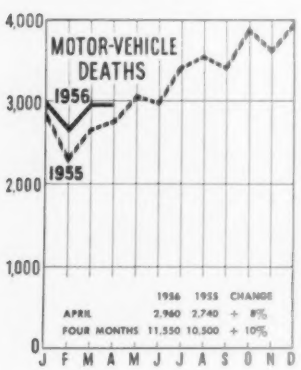
Deaths from work accidents totalled 1,100, about the same number as occurred a year ago. The four-month death total was 4,200, 5 per cent less than 1955.

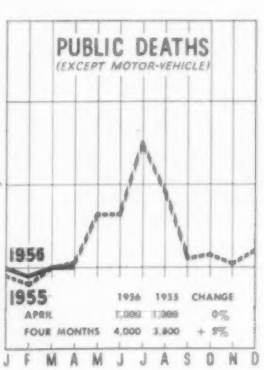
The April frequency rate for plants in 18 sectional accident prevention contests conducted by the National Safety Council was 5.37, a decrease of 7 per cent from last year. The April rate for plants in community council contests was 5.86, no change from 1955. In sectional contests, the four-month rate was 5.47, a decrease of 1 per cent; in community council contests, it was 5.72, an increase of 7 per cent.

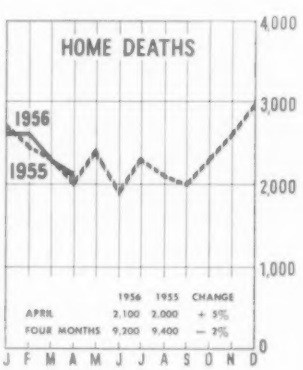
Public Deaths

There were approximately 1,000 deaths from public non-motor-vehicle accidents—no change from April, 1955.

The four-month total was 4,000, an increase of 5 per cent over a year ago. There were more deaths from falls, burns and firearms accidents and fewer deaths from drownings and transportation accidents. Aside from a small reduction in deaths of persons 25 to 44 years, all age groups showed increases over 1955, with the largest change recorded for persons 65 years and over.







NEOPRENE CORD SOLES

add comfort and extra-long wear to stylish safety shoes

by RICO

Courtesy: Record Industrial Company
Philadelphia, Pennsylvania

Here's a pair of rugged safety shoes that cleverly conceal their sturdy features. Soft brown elk uppers treated with Quilon* hide a steel toe, a leather toe lining and a wide, corrugated-steel arch. This moccasin-style blucher with storm welting affords the wearer maximum protection, plus casual comfort.

But more important are the comfort and protection from underneath provided by lightweight neoprene cord soles. They refuse to chip or crack, despite scuffing or abrasion...retain their neat profile, even under constant exposure to heat, oil, greases or solvents. Give your sales story the triple advantage of neoprene soles—rugged performance, stylish appearance and comfort.

*Du Pont's trademark for its chrome complex

Only neoprene offers this balanced combination of properties for work- and safety-shoe soles

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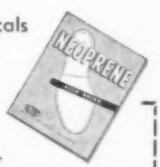

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THE SAFETY VALVE

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—TERENCE

The Executive Work Week

AN EXECUTIVE, to some people, is a man who can take two hours for lunch without disrupting production. Looking at it from the other side of the glass door, it seems that the big shot spends those two hours discussing weighty problems and soothing his ulcers with milk and bismuth.

Don't let the uncluttered desk and row of push buttons fool you. The chair behind the big desk may be empty much of the time, but its occupant often puts in longer hours than most of those who punch the time clock. His job, however, does not lend itself to time-motion study.

It is not always possible to say definitely how many hours are spent on the job. Where work involves planning, it is difficult to get away from it entirely—even on a fishing trip. The executive who can leave his job at the office is a rare one.

Work after hours is often necessary to get away from interruptions, to make time for reading, planning and correspondence, for meetings, or to handle labor negotiations which may last beyond normal bedtime.

To find out how executives use their time, *Management Review* (American Management Association) queried some of the top brass throughout the country. The article, "Of Time and Top Management," by Lydia Strong, has been reprinted in pamphlet form.

Among the 37 respondents, the work weeks ranged from 35 to 62.5 hours. They average 20 hours a week planning for the future.

Company meetings take up the second largest portion of the time, averaging nine hours a week. Personal contacts, not related to specific business objectives, use up seven to eight hours.

Business reading requires six hours and outside business meetings, conferences and conventions two to three hours.

A distinguishing mark of the executive, the article reminds us, is ability to organize and plan work. But no amount of planning can foresee all contingencies. Emergencies calling for immediate action recur too often for comfort. Some of the participants spent as little as five per cent of their time meeting crises; others as much as 50 per cent.

Almost as important is ability to delegate. That requires time to select, train and develop competent subordinates and work out a plan for delegation. One of the frequent complaints listed involved assistants who fail to follow through, misinterpret plain directions, and run to the boss about every little detail.

On the question of wasted time, everyone had a pet gripe. Too much talk—on the phone, at meetings, in unwanted interviews—leads the list. Following closely were wordy letters and reports, red tape, interruptions, and unnecessary paper work.

Almost unanimously, outside persons or events were blamed. Only a few men admitted failure to organize and control their own work schedules.

And with many an executive, community and national activities pile up the hours of overtime. Any successful man is sure to be called upon for leadership. And if he can speak entertainingly and/or convincingly, he spends many a lunch hour and evening on his feet.

And, let us not forget, the safety movement has been one of the beneficiaries of this unpaid overtime. Throughout the country these busy men are spearheading local safety drives. Thousands of them are taking part in National Safety Congresses and regional conferences. Without this voluntary leadership the fight against accidents would lose much of its drive.

From the survey, *Management Review* concludes that most executives work hard and enjoy it. Those who plan and delegate have been able to cut down emergencies and overtime.

In This Issue

Out on the Pacific Coast, the pulp and paper industry has written an encouraging chapter in safety progress. How management and labor worked together toward this end is told by the head of one of the industry's leading companies. (Page 18)

* * *

The golfer who forgets the score card and concentrates on his swing soon finds that his game has improved. That roughly parallels the policy of Kaiser Aluminum and Chemical Corp. In its awards the company balances sound programs with accident rates. Under this system there is little chance for an accidental good record. (Page 20)

* * *

When an experienced eye man is in charge, acceptance of the eye protection program is secured more easily. The result is both better vision and fewer eye injuries. (Page 24)

* * *

In his roving assignment, our fictional safety engineer uncovers a phony—one of those fellows who can make a program look good, even when compensation costs are way out of line with the frequency rates on the books. (Page 26)

Carman Fish

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AROUND THE COMPASS

ACTIVITIES • PROGRAMS • EVENTS

Edited by Phil Streit
Field Service Department, NSC

Hopper Appointed District Representative

Robert D. Hopper, has been named to the Field Service Staff of the National Safety Council as district representative. He will headquarter in Denver, Colo., where he presently resides with his wife and two children.

Since 1953 Mr. Hopper has been deputy director of the Colorado Highway Safety Council, a state agency, where he had experience in the development of highway safety programs, preparation of legislation, assistance to local groups, and cooperation with schools.

Previously he had taught in schools in Achison, Kans., and Wheat Ridge, Colo., where he organized and taught driver education. He later served during one summer as safety officer for an emergency project with the U. S. Forest Service.

Born in Fort Collins, Colo., he was graduated from Colorado A & M with an interruption for training and duty with the U.S. Navy Air Corp.

Baldwin Named Florida Director

William A. Leonard, Jr., president of the Northwest Florida Safety Council, Pensacola, Fla., has announced the appointment of Commander Lucian E. Baldwin, (USN ret.) as its executive director.

At the same time Mr. Leonard urged other plants in the area to follow the lead of the Chemstrand Corp. and the St. Regis Paper Co., which have taken out the first plant memberships in the organization. Chemstrand paid in $2,000 and St. Regis $1,500.

Commander Baldwin, recently retired from Naval Service after 31 years. His last assignment was security officer for the Pensacola Naval Air Station.

Campbell To Head California Foundation

Earl F. Campbell has assumed the post of managing director of

Earl F. Campbell

the new California Traffic Safety Foundation.

The Foundation, with headquarters in San Francisco, was recently launched by a group of prominent business and civic leaders. It plans a continuous and extensive program devoted to the prevention of traffic accidents and the facilitation of traffic in California.

Mr. Campbell's safety career goes back to 1935, when he was named manager of the Seattle Safety Council. He later became director of safety for the State of Washington.

In 1939, he was named director of the Portland Traffic Safety Commission. From 1942-46, he was Western region director for the National Safety Council.

In 1946, he came to Chicago on his appointment as manager of the Council's Field Organization Department and served in that capacity for seven years, until his return to California in 1954. For the past two years he has devoted his time principally to the development of the California Safety Foundation.

Mr. Campbell is a member of the advisory committee, University of California Institute of Transportation and Traffic Engineering and is a member of the American Society of Safety Engineers.

Bob Schmal to E. P. I.

Bob Schmal, for the past year district representative, National Safety Council's Field Service Department, has been named sales manager for Electronic Protection, Inc., a subsidiary of Standard Coil Products Company, Melrose Park, Ill.

Since joining the staff of NSC in 1951, he has served as secretary of the Police Division and Traffic Court Division of the Council and as secretary for the Committee on Tests for Intoxication. He is a graduate of the long course at the Traffic Institute, Northwestern University, and has written a number of articles for safety and police publications.

Electronic Protection, Inc., manufactures electronic systems for controlling traffic from moving emergency vehicles.

Tribute Paid New York Safety Council

A recent editorial in the *New York Times* paid tribute to the Greater New York Safety Council.

Pointing to the modest amount spent for safety in New York, the

—To page 129

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Each completed sling is then proof-tested at twice the load-carrying capacity for which it is rated. Then, and only then, does it receive the coveted registration certificate and tag.

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Board Votes Increase in Council Dues and Prices

STEADILY mounting costs of operation during the last five years were recognized by the Board of Directors of the National Safety Council on June 21 when official action was taken to increase membership dues and prices of Council materials. Also, in an effort to broaden use of Council services, the price differential to non-members was substantially lowered and practically all present restrictions on redistribution of Council materials were lifted.

The June 21 action followed preliminary discussion at the April 17 Board meeting when the Board accepted and approved the report of a Special Committee to Study the Financial Problems and Possible Sources of Financial Support for the Council. This Committee, which has made an exhaustive study of the Council's needs since its appointment last fall, was headed by Council President Ned H. Dearborn as chairman. Other members were George A. Jacoby, William H. Lowe, Robert T. Ross, Herbert E. Smith, and John Stilwell. Mr. Smith and Mr. Stilwell are members of the Board of Trustees.

The Board actions, based upon analysis by the staff under the Board's directive of April 17, were as follows:

Action No. 1. Gave first approval to revisions of the by-laws which will have the effect of increasing membership dues approximately 15 per cent in most categories.

Changes in the by-laws require action at two Board meetings. The proposed revisions, therefore, will become effective only after adoption at the next meeting of the Board. In the meantime, the Board action on June 21 provided for submission of the proposed changes to the various Conferences. Comments from the Conferences will be transmitted to the Board prior to its final action.

Action No. 2. Authorized the executive vice-president to prepare and put into effect as soon as possible a new single price list for Council materials, the prices in such list not to exceed an average of more than 15 per cent above present member prices.

Action No. 3. Authorized, when the new single price list becomes effective, a 10 per cent discount on all purchases by Council members, except that individual members would not be allowed to purchase quantities of employee safety materials at discount.

Application of these two actions involves not only development of the new price list, but also the working out of considerable administrative detail with respect to application of the member discount. Executive Vice-President G. C. Stewart stated that the exact date for initiating the new single price list cannot be determined at this time but that in all likelihood it will be about January 1, 1957. In the meantime prices to members will continue as in the present Service Guides.

Action No. 4. Authorized immediately, and continuing until the new single price list becomes effective, the sale of materials to non-members at Government prices, as quoted in Service Guide 2.1F.

Action No. 5. Authorized the immediate lifting of all restrictions on the purchase and redistribution of Council materials, except that individual members be not allowed to purchase quantities of employee safety materials at member prices.

These two actions, as indicated, became operative immediately upon action by the Board. New efforts to promote the use of Council materials among non-members are already underway and show promise of achieving excellent results.

The facts taken into account by the Board in arriving at the actions described above are fully covered in the staff report sent by General Stewart to Board members in advance of the meeting. The report follows:

"At the meeting of the Board of Directors on April 17, 1956, the Board considered the report of the Committee and voted '(1) that the report of the Financial Support Committee be accepted in principle; (2) that the recommendations in the report dealing with dues, prices, and services be referred to the staff for further analysis; and (3) that the staff be asked to propose appropriate implementing actions at the next meeting of the Board.

"The recommendations of the Committee, on which the staff was directed to propose implementing actions, may be summarized as follows:

First Recommendation. That dues be increased and service credit be reduced.

Second Recommendation. That prices of materials be raised.

Third Recommendation. That

—*To page 113*

Give yourself this "screen test"

☐ Check here

☐ Check here

Which of these movie showings commands more viewer attention, message retention?

Many training and sales promotional films command more attention . . . get their message across more effectively . . . when audiences do NOT have to sit and watch in total darkness.

Often it is far better when room illumination is controlled—kept at what psychologists call a "comfortable level for group discussion." This is approximately one foot-candle: about the minimum light necessary to read type the size of that in the preceding paragraph.

BUT, stepping up room light during film showings means you need a projector that throws maximum light on the screen to maintain contrast between the screen image and the surrounding area.

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By George MacDonald, *Industrial Department, NSC*

Got a problem in accident prevention or occupational hygiene? Questions are answered by mail, a few of general interest being selected for publication here

Canopies Over Manlifts Not Recommended

Question. An employee has suggested that a protective canopy of light metal or plastic be attached to the manlift belt about 6½ ft. above each step to fend off objects which may fall or be dropped from above. The canopy is to be rounded or conical and would extend no further than the step does from the face of the belt.

In addition to comments on the suggested canopy please advise what interpretation you place on the dimensions of the canvas bag for carrying small objects. The dimensions recommended in American Standard Safety Code for Manlifts (ASA A90, 1-1949) and the NSC Data Sheet D-Gen 2 (Rev. 1950) on Manlifts are 11 x 13 in., but we are not sure of the height, diameter, width, length, or shape.

Answer. We do not feel that canopies as suggested would serve a good purpose. First, they would tend to give the user a false sense of security as the size would offer only partial protection and would violate all established rules and regulations on the use of manlifts.

Secondly, the design and maintenance would present a problem. The placement of such a hood or protection would have to be high enough above the step line to allow the tallest man with a hard hat (average maximum 6 ft. 4 in.) to use it without inconvenience. The hoods would be a constant problem from a replacement standpoint when they became bent or broken.

They would also have to be of a size not to jam into the controller equipment at the head of the unit and they would cause a tripping hazard at the bottom end of the unit should an employee step on the hood or canopy and fall.

The canvas bag dimensions—11 x 13 in.—apply when the bag is flat. In other words, the bag is two pieces of cloth 11 x 13 in. sewed together edge to edge on three sides.

Exploding Scrap Metal

Question. We have a casting shop where we cast brass and copper into billets and bars for tube, rod, wire, and sheet stock. Castings weigh from about 1,000 to 2,000 lbs. The furnaces are of the electric induction type. Since we have no mechanical means of placing the charge to be melted in the furnace our casters have to shovel the metal into the furnace by hand.

Many times in the past, men have been splashed by molten metal when wet or oily scrap is placed into the furnace. The moisture on the scrap vaporizes and is trapped by the molten metal in the furnace. When the pressure builds up, molten metal blows out of the furnace.

What can we do to provide mechanical safeguards for this hazard, and what can we do to keep wet or oily scrap out of our furnaces?

Answer. Most companies have solved this problem by using mechanical handling. If this is not feasible at your plant, there are several other solutions.

Providing a covered storage place for your scrap metal would help solve the problem, unless of course, it was already wet when you received the scrap. However, some companies have found that keeping the scrap covered does eliminate most of the problems.

A chute has been used by several companies to help solve this problem. The chute is designed with a trap door that can be raised from a remote position. The proper amount of scrap is shoveled into the chute and the men move away from the furnace before the trap door is raised. If an explosion occurs under these conditions, the men are too far away to be splashed.

I believe, even without knowing the details of the physical layout of your furnaces, that such an arrangement could be used. The use of a long chute without the trap door would help.

Using Ladders In a Strong Wind

Question. An employee was injured recently when a high gust of wind caused the ladder on which he was working to fall.

Paragraph 130 of *Safe Practices Pamphlet No. 1* states, "ladders should not be used in a strong wind except in case of emergency . . . " What constitutes a strong wind?

I have calculated that on a newly-painted surface the ladder can begin to move in a wind between 22 and 30 mph. Do you agree with these figures? A number of assumptions were required to arrive at the final results.

It is believed an amount of work would be required in a wind tunnel to determine the effects of winds and streamlines to arrive at an accurate figure. What is your opinion?

Answer. The third edition of the National Safety Council's *Accident Prevention Manual for Industrial Operations* makes the same statement as *Safe Practices Pamphlet No. 1*, but amplified as follows: "Do not use ladders during a strong wind except in emergency, and then only when they are securely tied."

Public utility companies have found that the greatest difficulty in using a ladder in a strong wind is in erecting it. If one man attempts to get a ladder into position in a wind, it is likely to get away from him with the possibility of injury to himself and damage to property.

Of course, also, there is the further difficulty that the ladder

—*To page 128*

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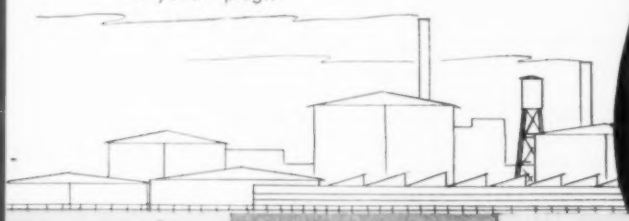

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WIRE FROM WASHINGTON

By Harry N. Rosenfield
Washington Counsel, National Safety Council

THE DRIVE to bring the current Congressional session to an end in time to permit the holding of the Presidential nominating conventions is curtailing enactment of all but the most urgent legislation.

Industrial Safety. Great interest has been shown in the findings of the National Academy of Science in its report "Biological Effects of Atomic Radiation." The report has instigated a number of requests before the Congressional Joint Committee on Atomic Energy for investigation of atomic radiation hazards. The Senate heard a demand for a check on all future use of atomic reactors for fuel until further medical knowledge is obtained on atomic hazards to human longevity. The Atomic Energy Commission called the Academy's report "a public service of major importance."

The Joint Committee on Atomic Energy approved H. R. 12050 and S. 4112 to provide for federal insurance covering nuclear accidents at privately owned atomic power plants, and to limit the liability of private owners of such plants to $500 million.

An AEC official speaking before the annual conference of governors, warned that "the utilization of atomic power will always present health and safety problems," indicated the importance of the activities of the state departments of public health, industrial safety and sanitary engineering, and complimented those states that had established committees of state officials to survey and study the impact of atomic energy on the state and to coordinate various state activities in the field.

The House Committee on Interstate and Foreign Commerce approved S.898, the trip-leasing bill specifying the conditions under which trucks transporting farm products to market can be leased for the return trip for other product-hauling. (See "Wire", May 1956). The Interstate Commerce Commission set January 1, 1957 as the effective date for its regulations governing additional brake requirements for safe operation of motor carriers.

The President signed into law Public Law 660 (S. 890), strengthening and extending the Water Pollution Control Act, providing $500 million for grants-in-aid to the states, over a 10 year period, for the construction of sewage treatment plants, and providing for research and research fellowships. H. J. Res 511, for approval of the New York-New Jersey compact for the study of air pollution, has been approved in the House and favorably reported in the Senate.

Highway Safety. Public Law 627, the biggest road-building program in American history, was approved by the Congress and the President. It provides for some $33 billion in federal-state funds for a 13-year highway construction program. The final form of the law includes a provision for a highway study, section 117, requiring a report to Congress from the Secretary of Commerce not later than March 1, 1959, with findings and recommendations. (See "Wire", July 1956).

Senator Gore, who played an important role in the legislative history of the new road-construction law, introduced S. 4152 which would abolish the Bureau of Public Roads of the Department of Commerce and transfer its responsibility for administering the new law to an independent bipartisan Federal Highway Commission of three members.

The Bureau of Public Roads announced a list of benefits to be expected from the new highway program, as follows: fewer traffic jams; longer less tiring vacation trips; increased safety; more jobs in highway construction; more jobs in supporting industries; community development; and more funds for other highways.

The Special Subcommittee on Traffic Safety of the House Interstate and Foreign Commerce Committee has started hearings and the collection of data. Its purpose, as stated at its first meeting, is "to push for investigating the Nation's terrifying death toll." Its hope is that its study "will result in methods for reducing such unnecessary mass suicide." The Committee plans to hold hearings in various parts of the country. Its investigation will cover five subjects: the human factor in accidents; vehicle design; maintenance and inspection; adequacy of laws and ordinances; highway design; and law enforcement.

At a meeting of the Advisory Council of the President's Committee for Traffic Safety, convened to appraise results of the recently held regional safety conferences, Deputy Presidential Assistant Pyle assured the Council of continuing White House support on the traffic safety program, but warned against "too much Governmental participation."

The Senate approved S. 313, authorizing chemical tests of intoxication for drivers within the District of Columbia.

Aviation Safety. Congress is literally buzzing with investigations of air safety. As a result of recent aviation accidents, demands were made for Congressional investigations. The House Interstate and Foreign Commerce Committee appointed a special

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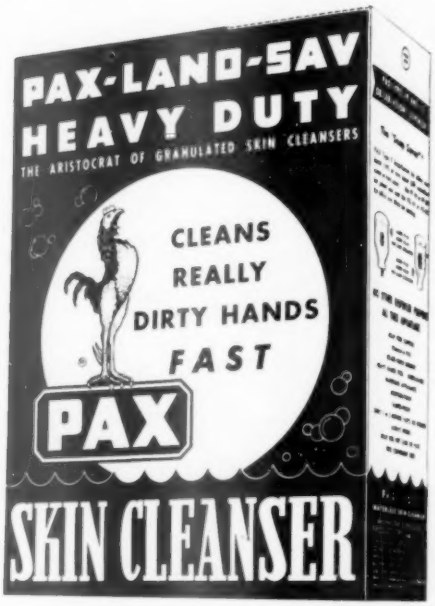

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National
SAFETY NEWS
AUGUST 1956

The Individual and the Mass

SOME OF the more serious problems of living and working together come from the tendency to regard human beings as standardized and interchangeable units. Actually, our social structure is more like a wall built from random field stone than one made of brick.

These differences in abilities and temperaments raise problems in job placement, safety and psychiatry, all of which are more or less related. Human relationships have become more complicated with the growth of industry. Machines have lightened physical labor and reduced working hours, yet tensions have increased, both on and off the job. Life has speeded up and there is a continuous struggle to keep up with growing standards of living. These problems are part of the individual's total environment along with the pressures of the job.

Mass programs are proving their worth in a variety of activities, yet they cannot replace personal contact. The employee fresh from a job training course can still learn much from his foreman and from his experienced fellow workers.

Getting into the field of mental and emotional health, the psychiatrist is receiving increased recognition. Usually, however, he sees only the extreme cases—the men who are really sick. In addition, there is a vast amount of non-professional psychiatry by clergymen and family doctors and on the job by supervisors and fellow employees.

Some of these amateurs help the troubled person with concrete suggestions for solving his problems. More often they are just sympathetic listeners who give the "patient" a chance to unload his troubles. They are not psychoanalysts.

The supervisor and the executive have doubts and anxieties, too, and often they are in a more difficult spot than those below them. As men get promoted they take on heavier responsibilities and there are fewer people with whom they can let down their hair.

To industry, psychiatry suggests a twofold approach: mass programs for better industrial relations should be supplemented by an individual approach, and the individual should be viewed in his total environment.

Recognition of emotional disturbances, particularly in ambitious employees, must be based on solid knowledge of individual personality. Getting behind a person's everyday mask is something to handle with extreme discretion. Individuals often resent prying into their private lives, and employers don't enjoy it either.

A healthy climate is a must for mental health. Expressed simply, it means maintaining a place where people get along with each other. This requires an understanding of human motivation on the part of those who have authority. The executive may need advice in dealing with the human side of his job, also counseling to overcome personal conflicts.

And perhaps psychiatric tests for the boss might be included with the urinalysis in his regular health examination.

A Shared Responsibility

By J. D. ZELLERBACH

Management has a responsibility for safety in proportion to its authority. But this responsibility must be shared with labor and with the individual worker — completely and wholeheartedly

DURING 1955, in all industry divisions within the scope of The President's Conference on Occupational Safety there were more than 1,700,000 disabling injuries. The number of fatalities exceeded 12,000.

My point is this: the majority of these injuries and deaths occurred in industries operated by American management.

The figures, in short, provide us with a graphic indication of the tremendous scope of the safety problem. It is management's responsibility to use every device available to lower the number of deaths and injuries.

It must be recognized that management has made great steps forward in making American factories, mills and mines safe places to work. We know that American management as a whole has become acutely safety-conscious and that no responsible industrial concern can afford to function without a sound accident prevention program.

But we also know that to the homes and families hit by fatalities, to the permanently disabled, it makes little difference whether the figures are relatively better or not. Death and pain are not relative. They are bitter reality—to the man who is hurt, or to the surviving family.

Taking accident prevention from the management viewpoint, we can start with the fundamental assumption that management is most emphatically responsible for industrial safety in the United States. That responsibility will be reflected in thousands of individual safety programs across the country, programs designed to protect American workers from the physical hazards of employment.

But whereas certain obvious jurisdictional lines can be drawn between management and labor in many areas of industrial activity, no line can be drawn where safety is concerned. Safety represents a unique form of responsibility in that accident prevention cuts straight across every industrial organization and involves everybody—without exception.

This means that management

Fabian Bachrach Photo

J. D. ZELLERBACH is President, Crown Zellerbach Corporation, San Francisco. This article has been condensed slightly from an address before The President's Conference on Occupational Safety, Washington, D. C., May 16, 1956.

THE PULP AND PAPER industry on the Pacific Coast has been the scene of exceptional safety achievements brought about by the joint efforts of management and employees. One of the larger mills, shown below, is at West Linn, Oregon.

must share its responsibility for safety with labor and with the individual worker, completely and wholeheartedly. We might call accident prevention the "eternal triangle" of industrial relations, to take certain liberties with that familiar phrase. On the one side there is management, on the second side organized labor, and on the third side the worker himself. Unless there is a sense of mutual responsibility for safety, a sense of personal participation by every member of the organization, the triangle flies apart and people get hurt.

I want to discuss some of the implications of the "triangular" approach to accident prevention and then show you how we have used this approach in the field where I am most at home: the Pacific Coast pulp and paper industry.

Management's responsibility to provide a safe place to work requires far more than the provision of guards around machinery or dangerous chemicals, adherence to State and local safety regulations, or the establishment of elaborate safety campaigns. It requires the generation and the steady maintenance of a "safety climate."

This climate must induce every member of the organization, from top management down to the man on the line, to think, feel and breathe safety all the time.

If the safety climate is sufficiently well developed, it should also permeate home and community and thus act to prevent accidents away from work—where most accidents occur. An employee who injures himself falling from a defective stepladder while pruning an apple tree is just as much a loss to the company as though he had been hurt on the job.

This need for a good safety climate cannot be over-emphasized. Indeed, it has been growing steadily in American industry through the years. Where it does not exist it is apparent that top management or the employees are either indifferent to safety or merely paying lip service. Such a plant cannot be completely safe. In a complex industrial facility—and what facility is not complex—the lack of a good safety climate can be dangerous to management and labor alike.

"TREES FOREVER" is the watchword of Crown Zellerbach Corp. To attain this goal, the corporation operates 14 tree farms covering 635,000. Constant vigilance is maintained to protect this vital crop against destruction by fire.

To build a proper safety climate, management must have full cooperation of union and individual worker. Each must hold up his end of the triangle. There can be no blockage of communications, no attitude of "let the other fellow do it," no abrogation of mutual responsibility. Management cannot afford it because of its legal and moral obligations to employees and because of its heavy investment in trained manpower and in equipment. The union cannot afford it because it is obliged to promote the welfare of members. The individual worker cannot afford it because his good right arm, and possibly his life, are at stake.

The plain fact is that nobody can afford it. The pursuit of safety is about the most "mutual" interest I know of.

To generate a proper safety climate, management must be prepared to do everything within its power. Safety must be built into the entire industrial process, from the building of new plants and equipment to the lowliest work order. The plant manager, backed up by top management, must be ready and willing to curtail production in order to solve a safety problem. And the safety message must be effectively communicated up and down the line.

Building safety into the industrial process obviously calls for system and method. A program is the *sine qua non* of acci-

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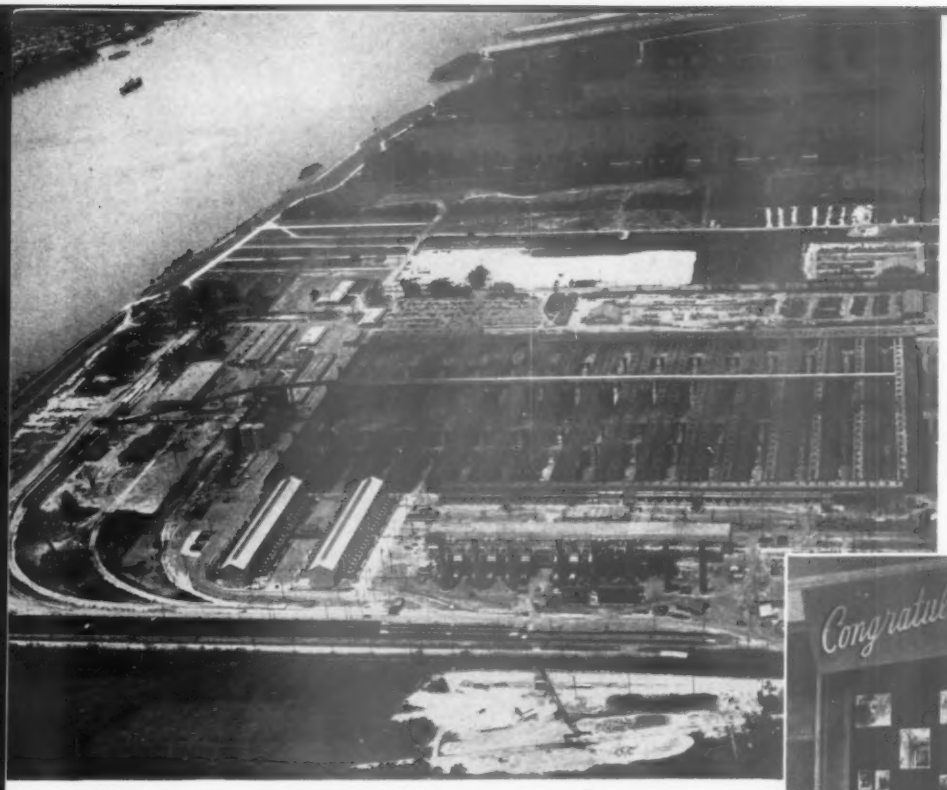


AERIAL view of Chalmette Works, Kaiser Aluminum and Chemical Corp., looking up river toward New Orleans. Alumina from Baton Rouge Works is brought by hopper car to unloading building at right and carried by conveyor to storage.

INSET: Proudly displayed at the Personnel Building are Chalmette's two trophies—the Kaiser Cup and the National Safety Council's Award of Honor.

Chalmette Works concentrated on building the organization and the safety program...

The Awards Followed

By CARMAN FISH

DO THE JOB WELL— the record will take care of itself.

That sums up the idea back of the safety program of Kaiser Aluminum and Chemical Corporation. And the performance of Kaiser plants in recent years proves that it works.

Kaiser Aluminum believes in contests and awards. The corporation likes to report millions of man-hours without a disabling injury and new low rates for frequency and severity. But it does not believe these alone are adequate yardsticks for safety performance.

Five years ago the company developed an award system which would minimize the element of luck. It was based on the following 10 factors, each counting 100 points:

1. Accident experience
2. Housekeeping
3. Suggestion system
4. Safety manual (for supervisors)
5. Safe practices manual (for employees)
6. Personal protective equipment
7. Injury statistics analysis
8. Hazard control surveys
9. Safety committees
10. Interest and motivation.

With this broad base it is practically impossible for any plant to win a company award on a no-accident record that looks like a miracle or for a paper program that falls down on results. And perhaps even more important, this system promotes activities and develops attitudes that will keep on preventing accidents for years to come.

The Kaiser Aluminum & Chemical Corporation safety program covers a wide variety of operations, from the mining of bauxite in Jamaica through reduction of the ore to alumina (aluminum oxide), production of aluminum pigs and ingots, flat rolled products, extruded shapes, structural shapes, rod, wire, cable, etc. Much of the pig and ingot production goes to independent fabricators. In addition, the Corporation's Chemical Division operates several plants producing dolomite, magnesia and basic refractories. All told, the various operations employ more than 16,000 persons.

From company headquarters in

Oakland, Calif., comes much of the inspiration and direction of the widely scattered safety activities. Yet each unit has a free hand in working out its own program. There is help and encouragement from headquarters and the incentive of competition with other plants. Heading the safety department is Homer K. Lambie, whose title, safety coordinator and consultant, indicates the safety relationship between headquarters and the various operations.

Three types of awards are given in recognition of outstanding safety performance.

- Top award is the Kaiser Cup which goes to the plant with the outstanding program based on the ten points previously listed.
- The Progress Award is presented to the plant which has made the greatest progress in the program—not merely in reduced accident rates.
- The Achievement Award goes to the plant, group, individual, or local union which has contributed most to accident prevention.

The first two awards are cups and the third is a plaque—all made of aluminum, of course. All awards are given annually and become the permanent property of the winners.

Awards are decided by a top level committee of vice-presidents and general managers who evaluate the plant programs submitted for their review. They consider the quality of the program and its acceptance by the plant, in addition to its effectiveness in controlling accidents.

In spite of a multi-million dollar expansion program, with heavy demands on executive time, representatives of management's upper levels has been spending a week or more each year traveling from plant to plant where safety achievements are recognized with impressive ceremonies.

Chalmette's Record

Outstanding among Kaiser Aluminum plants during the past year was the Chalmette, La., Works. For 1955 it won both the Kaiser Cup and the National Safety Council's Award of Honor. These top honors in both groups were won with an accident frequency rate of 6.21 and a severity rate of 286 as compared with 27.06 and 750 average for the previous three years.

Compared with the industry's average for 1955, Chalmette was 67 per cent better in frequency and 74 per cent better in severity.

Baton Rouge Works, with 1,541,000 safe man-hours, also won the Council's Award of Honor, plus the Kaiser Progress Award.

Each year for the past three years the local union representing one of the company's plants has been awarded a plaque for outstanding contributions to the safety program.

Chalmette's honors were presented on a grand scale in the New Orleans Auditorium on Sunday evening, April 22. A special performance of "Holiday on Ice" had been arranged, with employees and their families as guests. The Council's Award of Honor and the Kaiser Cup were presented during intermission, with nine-year-old Sharon Lee Helm sharing the limelight with company officials and guests. Her essay, "Why I Want My Daddy to Work Safely," was printed and a copy given to each of those present.

In addition to these major awards, Works Manager E. H. Sangwine presented 13 trophies and certificates to department superintendents and their union representatives for outstanding improvement in safety experience.

Located seven miles down river from New Orleans' Vieux Carré, in St. Bernard Parish, Chalmette Works is the largest aluminum reduction plant in the U.S.A.

Here, over 400 million pounds

ARTHUR NAQUIN, president of the New Orleans Metropolitan Safety Council, presents the NSC Award of Honor to E. H. Sangwine, Chalmette Works manager, and R. S. McClintock, safety supervisor.

SHARING the spotlight at presentation of the Kaiser Cup was Sharon Lee Helm, winner of the children's essay award. Others, left to right: T. J. Ready, Jr., vice-president, Kaiser Aluminum and Chemical Corp.; Carl Geiger, general foreman, Chalmette Works; Claude B. Busby, business agent, Local 225, Aluminum Workers of America.

"HAZARD HABIT," a vaudeville type villain, was used on the record board for Safety Achievement Month. Top section, in red, carried a graph to show all occupational injury frequency to date. The graph was subdivided by a "500" frequency line. SAM exhorted all employees to keep the frequency graph in the green, or under 500. The lower section was used as pledge board. Employees signed green safety pledge cards and tacked them within the cross outline over the villain as a symbolic obliteration of the hazard habit by the Green Cross of Safety.

of primary aluminum are produced annually, more than twice the entire output of this country before World War II. Plant employment is currently over the 2,000 mark.

The plant was started in February 1951 and produced the first aluminum in December of that year. The reduction plant was completed in September 1953. The site covers 350 acres and contains 75 buildings, some of them of vast dimensions, where supervisors cover their territory on bicycles.

Bauxite for Kaiser Aluminum is shipped from Jamaica to the Baton Rouge plant where it is refined and the alumina shipped in hopper cars to the reduction plants. At Chalmette the cars are shunted into the unloading building where the oxide drops through a grated floor onto a 24-inch continuous conveyor belt which carries it into the reduction plant.

Since approximately 10 kwh. (d-c) are needed to produce one pound of aluminum, power is a vital part of the reduction process. To produce more than 400 million pounds of aluminum a year requires enough power for the industrial and domestic needs of a city of one million population.

Power is generated in two plants. The smaller is the Nordberg engine plant with a total capacity of 103,000 kw. (d-c). These are internal combustion engines using natural gas as fuel. The steam plant generates 375,000 kw. (a-c).

More than 310 million gallons of water are pumped daily from the nearby Mississippi River, chiefly for power facilities, air control and for generating steam to drive the turbines in the power plant. Ninety-nine per cent of it is returned, uncontaminated, to the river.

When it comes to getting the facts, TV's Sergeant Joe Friday has nothing on Chalmette's safety department. Training, supervision and investigation all contribute to the plant's outstanding record.

Carrying out the details of the program are Robert S. McClintock, safety supervisor, Norman B. Hall, assistant safety supervisor, and John A. Janous, safety trainee. And Works Manager E. H. Sangwine is an active member of the safety team.

Accident reporting is unusually strict, going beyond the ASA definitions in some respects. If a man declines to return to work after an injury, the full time loss is charged, regardless of medical opinion. Hernias and back cases are also included, even some of uncertain origin.

The Injury Report Form, used by all Kaiser plants, gives full details of every case that comes to the dispensary—disabling, minor, non-occupational or doubtful.

Also included are colds, headaches, stomach upsets, eye irritants, skin irritants and allergies of non-occupational origin. These details are helpful in giving the safety and medical staffs a better understanding of the individual's physical characteristics—information which may be helpful in placement and in determining obscure causes of disability.

Five copies of the report are made. The original is retained for the first-aid log. Carbon copies go to the safety supervisor, one to headquarters in Oakland for IBM tabulation, one for department files, and one for the personnel medical record.

The Safety Proctor System has uncovered many an unsafe practice or condition, provided material for safety meetings, and trained many an employee to be on the alert for hazards. Each month an employee is appointed safety proctor for his department or crew. He is issued a notebook bearing his name, payroll number and department. It consists of a folded card with a pad of blank sheets stapled to the inside for recording the unsafe condi-

tion or practice noted, department responsible, and action taken. Suggestions of what to look for are included, also instructions for follow up. At safety meetings, the proctor is instructed to:

1. Report each condition to the crew.

2. Tell them what action was taken to correct it.

3. Tell what might have happened had it not been corrected.

4. Tell how this can be avoided in the future.

Meetings have a conspicuous and important place in Chalmette's program. They are held at all levels from the works manager and superintendents, the foremen, and the various departments and crews. Every supervisor is required to hold a monthly meeting for his men and many helps for effective meetings are available.

The *Safety Meeting Guide*, issued weekly, outlines suggested procedure for a 15-minute meeting. It is arranged by steps: Objective for the week, specific information for the department, safety proctor's report, controlled participation through questions, visitor's participation.

One of the points on which each plant is judged in interplant competition within the company is "Hazard Evaluation." When an accident is reported, or when a condition is detected before an accident occurs, the investigation includes the following points:

1. How many employees are exposed to the hazard responsible for this accident?

2. How often have similar accidents occurred in this department?

3. How serious are the results?

4. Corrective action is . . . urgent . . . essential . . . very necessary . . . desirable?

What to do with the accident repeater is a universal and perennial problem in industry. At Chalmette a too-frequent customer of the first aid department is called in to the safety department for an interview. The employee being interviewed is definitely not on the carpet. He is encouraged to talk to an interested and sympathetic listener who is anxious to find the causes and help him. A detailed report is filled out on each case and one of the questions is: "Did you reassure the man—relieve the tension? . . . Express your satisfaction and confidence in him?"

Showmanship has a place in the program and special campaigns have been found helpful in stimulating safety awareness and recognizing improvement. Last November, posters announced to the plant that "Sam" was coming. Suggested by the National Safety Council's "Sammy Safety," Sam personified "Safety Achievement Month." The timing coincided with Safe Driving Day (December 1), and Christmas. The goal was a month with an all injury frequency of less than 500, both minor and disabling, but off-the-job injuries were also stressed in the publicity.

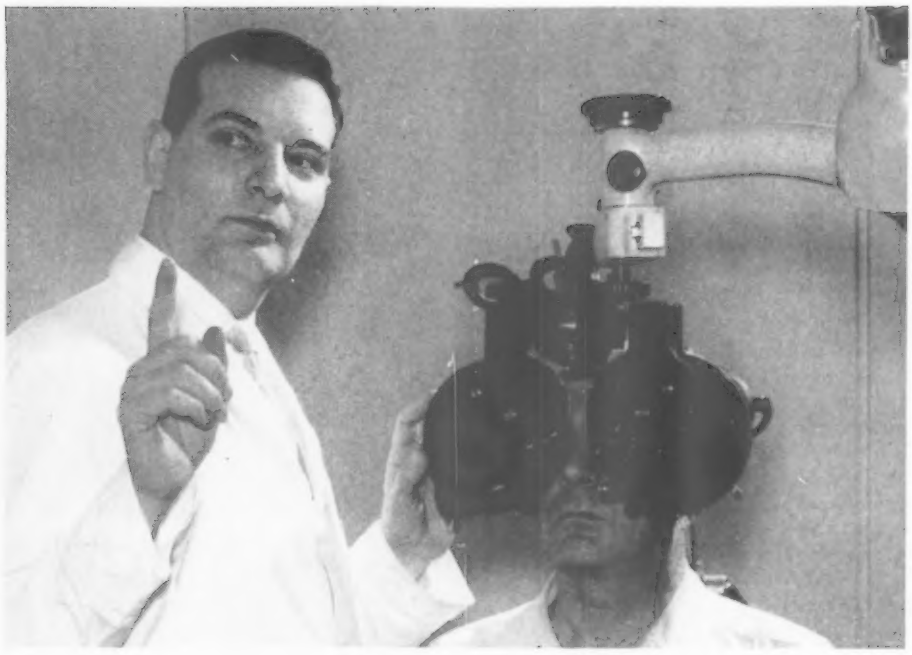
The campaign, inspired by Works Manager E. H. Sangwine, was a plant-wide affair, actively supported by Local 225 of the Aluminum Workers International Union. Safety pledge cards were issued and signed, a safety slogan contest was launched and a telephone quiz conducted. A safety essay contest was held, with a $35 gift certificate for the wives and a choice of prizes for the children. During the month 79 turkeys and hams were awarded, and individual achievement awards included 900 cigarette lighters, 500 mechanical pencils and 900 manicure sets.

Chalmette kept well within the frequency goal of 500 for the month. It made employees more fully aware of the company's safety program, it recognized the efforts of those who participated, and everybody had a good time.

Summing up SAM, it demonstrated once more Kaiser's conviction that the spirit of its people is its greatest asset—that a group of people working together for mutual benefit can meet — and beat—any goal that is set.

MEMBERS of Chalmette Safety Section plan program for Safety Achievement Month (December 1955). Left to right: E. J. Coyne, assistant safety supervisor; John A. Janous, safety trainee; R. S. McClintock, safety supervisor, and Norman B. Hall, assistant safety supervisor.

BANNERS attached to the Personnel Building were used as "ticklers" to announce "SAM," or Safety Achievement Month.



OPTOMETRIST gives an eye refraction to determine the prescription most suitable for the job. Prescription will be included in employee's safety glasses to assure good vision and safety on the job.

Your Plant Can Have Better Vision, Too

By HERMAN SAGER, O.D.

DURING the past decade the value of vision programs in industry for the protection and correction of the employees' sight have been promoted by numerous agencies such as the various safety councils, the ophthalmic professions, the optical companies and societies for the prevention of blindness.

As a result, the majority of the industrial companies throughout the country have become increasingly aware of the importance of such programs. Many understand the great contribution to the public health they are making by the conservation of their employees' sight by protecting their eyes. Many realize the great savings that accrue from the curtailment of eye injuries and the improved seeing efficiency that is obtained for their employees.

Many companies are spending thousands of dollars for safety eye equipment without getting the proper return for their expenditure. Most of this safety eye equipment is handed out indiscriminately without proper analysis of the hazards that exist on the job and also without benefit of the proper fit of the safety glasses for comfort. A week or two after the initial enthusiasm of issuing the safety eye protection, most of the glasses and goggles are usually lying about on machines or in drawers and not affording the protection for which they were meant, and the vast expenditure for this equipment has gone to waste.

Sperry Gyroscope Company has had a tremendously successful program during its 12 years of operation. Not one eye has been lost in all these years. There has been only one serious accident which occurred a year ago and resulted in partial loss of vision. Our first-aid cases have been reduced by more than 90 per cent during this period.

Professional services. The primary factor in achieving effectiveness in your eye program is the proper administration and supervision by the one trained and experienced to conduct such

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DR. HERMAN SAGER is Supervisor, Eye Service Section, Medical Department, Sperry Gyroscope Company. This article was adapted from a talk presented at the 26th Annual Greater New York Safety Council Convention and Exposition, April 17, 1956.

a program. This means obtaining the services of a trained professional eye man. The same would hold true in the establishing of a safety department. Placing a foreman, purchasing agent, or a personnel man in charge of such a program could never make it as effective as putting a trained safety engineer in charge.

A professional eye man should have the responsibility of supervising the eye program. He can contribute half a day every two weeks in a small company or be associated on a full-time basis with a large company. The expenditure for such service is negligible in return for the savings that can be gained through elimination of wasteful purchases of safety eye equipment and through the greater effectiveness obtained from putting this equipment to work.

The professional eye man can render the following services to industry in supervising the eye program:

1. In association with the safety engineer to make a study of the eye hazards existing in the many job classifications, and to determine the type of safety eye protection needed for each job.
2. To see that all safety glasses are properly fitted for maximum comfort. If safety glasses do not fit comfortably they will not be worn.
3. To maintain the safety glasses so that they are constantly in good condition. To replace lenses that may be badly scratched and to repair broken parts of the safety glasses when necessary.

   An employee will wear safety glasses although he may be temporarily uncomfortable if he knows he will be able to see the eye specialist at a certain time during the week to adjust his glasses. If such is not the case he will usually just discard them knowing that nothing can or will be done for him.
4. He can perform the necessary eye tests to determine the prescription needed for each employee's job. The prescription can then be incorporated into the safety glasses.
5. He can set up the pre-placement vision testing procedures and also the vision standards required for each job.

Education. The best means of getting over to the employee the importance of wearing this eye protection is by individual conservation. This can be accomplished when issuing and fitting the safety glasses. A five- or 10-minute discussion with the employee does the greatest amount of good in making him understand the importance of the eye safety program. Other techniques can be as follows:

1. Periodic articles on eye safety in the plant newspaper.
2. Prominent display in the plant cafeteria or on a wall along the main aisle of smashed safety glasses that have saved eyes.
3. Posters displayed in hazardous areas.
4. Film that can be shown to applicants at the indoctrination period.
5. Membership of company in the Wise Owl Club. This club is made up of employees whose sight has been saved by wearing safety glasses. Each employee is enrolled in this club and is issued a Wise Owl pin which he wears prominently on his apron or on the plant badge.

Enforcement: The most important individual in the enforcement of any such program is the immediate supervisor. He is near his men throughout the day and can observe those who are offenders very easily.

A foreman or supervisor who is safety conscious and who sets the example himself by wearing his safety glasses will usually experience little trouble in having the people in his own department follow his example.

Management should adopt rules which will make disciplinary action possible if absolutely necessary.

Records. Thorough, well-documented records of employee's visual status, at the time of employment and during his employment, should be kept. Knowing what anomolies of vision employees have may be very vital in compensation cases that arise years later.

Maintenance. A good supply of safety glasses and parts should

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APPLICANT for employment receiving a visual analysis test by vision technician to determine whether applicant's visual capabilities meet visual requirements for the job.

EMPLOYEES have safety glasses fitted and adjusted by the optician. It is highly important that the safety glasses are fitted individually to each employee's face to assure comfort.

THE DIARY OF A SAFETY ENGINEER

(Fiction)

From outward appearances the plant seemed to be in good shape — too good. Did the records tell the true story or was our engineer being misled?

The Gentleman Is Neat

By BILL ANDREWS

August 1, 1956

THE PLANT SUPERINTENDENT was cordial. "Glad to have you here," he said. "I'm proud of our safety record. You'll find Dander, our safety engineer, is a top-flight man in his field. A very good administrator."

I thanked him and said I'd be very interested to learn about their operations. Then he called Dander and I went off with him.

The safety office was quite impressive. There was a carefully drawn chart on the wall. The desks were neat, and there were banks of file cabinets. The bookshelves contained all the major reference works, and they were very neatly arranged and well cared for.

A cabinet contained a neatly labeled display of safety equipment, and the posters on the bulletin board were the latest NSC releases.

Dander himself was in his middle thirties, a very neatly dressed and well-groomed gentleman with a gracious manner.

Suddenly I remembered him—we'd met at a Safety Congress in Chicago in '52 or '53. He had asked some questions of me—intelligent questions, yet I remember being rather surprised at their elementary character considering that he was chief safety engineer of a company employing 10,000 workers.

Like the superintendent, he offered me, as the roaming consultant of Eastern Enterprises, full access to information and full cooperation. Then he spent 15 minutes telling me how good and effective was the safety program he administered.

I was beginning to wonder why Eastern instructed me to make this plant an early stop in my tour of their subsidiaries. The other plants I'd visited all had major headaches, and had apparently been chosen for that reason. But here, on the surface, all was success, efficiency, progress. The line on the frequency chart on the wall showed a fairly consistent drop, and the absolute figure was better than industry average. It wouldn't win any NSC sectional contests, but it had the average beat by quite a bit.

I asked for some monthly reports, and the data in them seemed to bear out the chart picture. The reports were attractively prepared, and had some rather elaborate breakdowns of accidents and near-accidents.

After spending an hour on the records, I went for a walk under Dander's guidance, touring the operations in the two largest buildings of the plant. There were some signs of good engineering work—and some signs of work not so good. The safety bulletin boards through the plant were neat, and the posters on them were up to date.

I came back from the tour wondering what was missing—what it was that didn't ring true about the tour and about the records—and, more fundamentally, about Dander himself.

It wasn't till I was in my hotel room that night that I realized the first missing part of the picture. I had spent at least two hours on the shop floor with Dander, and I had never heard any man below the rank of department foreman speak to him. And Dander himself had never spoken to them, either.

And I realized, also, that nobody was stopping to look at the safety bulletin boards. There weren't even any greasy thumb prints on the glass of the cases to show where some shop hand had leaned to look, or had pointed to something that caught his eye.

It was all very correct. We had had nice talks with foremen, clear explanations of procedures and

problems. But it was as if there was a wall between Dander and the ordinary worker.

Next morning I mentioned this point, and Dander explained glibly that his policy was to deal entirely with management and supervision, not interfering, not fraternizing with the hired help. He had a set of plausible reasons for that policy, but I couldn't help looking at his immaculate hands and wondering if they had ever come in contact with a dirty hand or been laid on a greasy coverall shoulder.

It was sour; it was cold; it was stiff. It was the distant, caste-conscious attitude of the insecure man who is very conscious both of not being at the bottom of the heap and not being at the top, but wanting to appear to be near the top.

I made Dander very unhappy by going into the question of his own background. He tried to pretty it up, tried to make it sound like a real success story. But in the end it came to this, that Dander had been, in 1948, a clerk in the personnel department handling, among other things, compensation claim papers.

He had ingratiated himself with the front office in ways not clear to me, and had been appointed to replace the former safety director on his retirement. He had ordered all the right books, gone to Safety Congresses, worked very hard to replace an old, tired man's bumbling with crisp efficiency. But he had brought no technical know-how to the job, and he had, I think, evaded exposure of his ignorance, by evading contact with the people down on the job.

Once the word "evaded" came into my mind in connection with the social contact, I began to wonder about the statistical record. I looked over the reports again. In a file copy of the 1955 sectional contest report which he had sent to NSC, I suddenly came upon a severity figure. It was high—too high for the industry, too high by a good deal for a plant this size in the industry.

But what hit me harder than the figure, was the fact that there was nowhere in the material he had shown me up to that point any severity figure at all. The frequency was calculated and reported precisely. Cause and location were explicitly stated and analyzed. But no severity data.

I asked for it, and Dander assured me blandly that it wasn't important to have severity data.

"Oh," he said, "I know that the National Safety Council wants it, and I suppose it has some validity for the national averages. But it's all a matter of luck, and doesn't mean anything at the level of individual plant."

I just looked at him, wondering if he believed what he said, or whether he was covering. So I didn't contradict his argument. I just asked for the severity data over the last five years. He told me it would be a lot of trouble to get it out for me. But I knew he had entered the sectional contests regularly, and so I suggested that I still wanted it, but that the copies of the contest reports were all I would need, not any special computations.

His reaction answered the question of whether he was covering up. He went into a long spiel about the unreliability of the data, the necessity of viewing the data in a context of changing operations and labor force. "I still want to see 'em," I said. And, after some more argument, he handed them over.

They were bad and getting worse. They worked out at something like three times the severity which industry averages would lead you to expect from the frequency rate he was reporting.

I didn't comment to him. Instead, I got the data down in my

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"Chicken"

What's with this "chicken" routine?

Seems like a basic conflict concerning what's to rule in this world —intestines or brains.

It's no mark of distinction to have guts; even mammals of the lowest order have them. It is a mark of distinction, though, to have brains—and more so even, to use them.

This "chicken" cry usually arises in a group situation where some squarehead with a loud mouth and sleepy brain cells gets the floor. Perfectly intelligent bystanders become bewitched by mass psychology—mostly from a fear that they won't conform.

Why are persons so afraid they won't conform? It takes more intestinal fortitude to stand up for one's own convictions than to milksop along with a mass of weak-willed individuals who have a Russian roulette attitude toward life. It's difficult to find sympathy for a person who has no more concern or gratitude for the things life has to offer than to lay them blindly on the line in response to some challenge by another who has no particular claim to fame.

What would this old globe be like if we didn't have people here and there who stood their ground and struck out their separate ways, instead of running wildly with the herd? Progress and new ideas come from those not blinded by the commonplace, routine monotony of the mass.

Adolescents aren't the only ones with this weakness, unfortunately. We constantly find adults who pooh-pooh the use of safety goggles, safety shoes, getting first-aid treatment, using machine guards, obeying traffic regulations, etc., etc., etc. They call it sissy stuff.

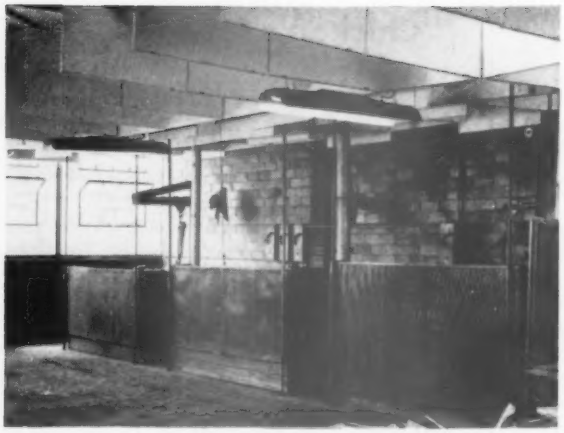
How immature can they be?

They don't prove they have guts by such an attitude, but just that they have no brains. Strictly mammals of the lowest order.

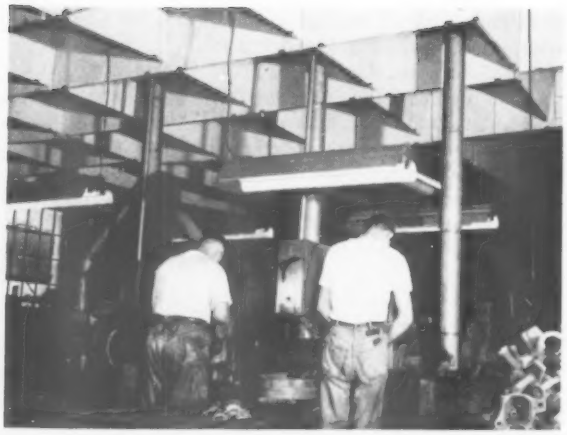
Only fools seek strength by doing what they think the mob expects of them rather than what they know they should do. Only weaklings try to bolster their ego by shouting down the will of others.

Any goof can assure himself of anonymity by running when the pack yells, "Chicken!"

ROBERT D. GIDEL



TUMBLING BARRELS with baffle barriers on guards.



OVERHEAD baffles in cleaning room.

Dampening the Foundry's Din

Two inches of sand, some baffles, and a coating of sound deadener made this noisy cleaning room a better place to work

WHEN studies showed the average noise level in its foundry cleaning room ranged from 94 to 106 db., the Allis-Chalmers La Crosse, Wis., Works decided to do something about it.

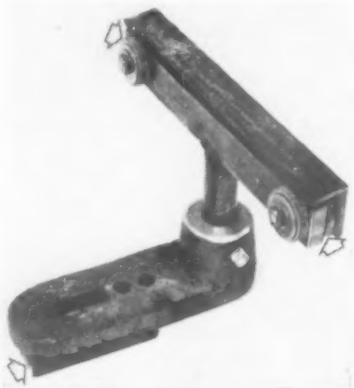
A few months later some relatively simple and inexpensive abatement measures had cut the din to the 87-91 db. range.

The first steps were to determine the chief causes of noise and to analyze the construction of the building.

The building. The cleaning room, separated from the rest of the building by a tiled wall, is 40 x 70 ft., with a single saw tooth roof coming to a peak 30 ft. above floor level. The floor is concrete with wood blocks in the center area. Walls are lined with brick or tile. The ceiling is asbestos tile, block type, with a vertical skylight running the length of the building.

Steel girders and supports form an overhead network approximately 12 ft. above the floor. Windows cover an area of 8 x 40 ft. on the east and west walls. Exits consist of one double and two single doors.

Operations include trucking, tumbling, wheelabrating, grinding, and cleaning castings. Of the four tumbling barrels, two are regularly used only the first three hours of the morning. On occasion, the third and fourth barrels are also brought into operation.



SPECIAL tool rest for grinders. Arrows indicate washers and pads installed to reduce vibration noise.

One wheelabrator is used steadily throughout the morning and intermittently during the afternoon. The other is a standby unit seldom used.

Four 20-in. diameter double-wheel pedestal grinders, one swing grinder, and a number of small air grinders are employed during the morning hours. Placing of castings into trays and wheelabrator hoppers is an additional source of noise.

Noise Abatement Measures

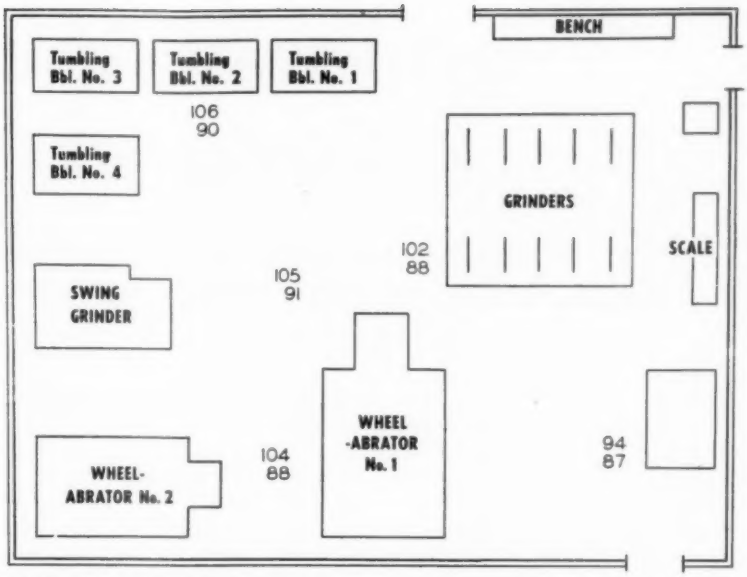
Since the chief sources of noise were found to be tumbling barrel, wheelabrator, and grinding operations as well as placing castings into trays, noise abatement measures were directed toward these operations.

Tumbling Barrels. The chief source of noise in tumbling barrel operations is the impact of the castings upon the barrel. Some of the noise is transmitted through the air and some through the barrel mountings to the floor. Therefore, noise baffles were installed

in front of the barrels to reduce airborne noise transmission and vibration isolators were installed on the barrel mountings to reduce vibration transmission along this path.

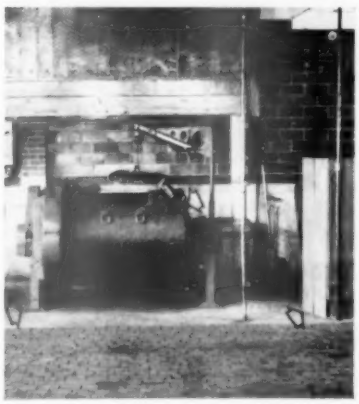
The noise baffle consists of a plain wooden barrier with inward tilting wings, installed in front of each barrel. No. 3 spruce boards, ¾-in. thick and 8 in. wide were fastened to wire mesh guards in front of each barrel. The inner lining of the barrier was sprayed with a ⅛-in. coating of a rubber-base sound deadener. The outside of each tumble barrel was sprayed with a ¼-in. coating of this same deadener to reduce resonance of the metal so that the noise is not radiated from the barrel.

Several types of vibration isolation mountings were considered. A commercially available material of fabric and rubber was selected for the job. Grommets and washers of this material were installed on the nuts and bolts and ⅝-in. thick pads were placed under the footings to reduce vibration transmission.



LAYOUT OF FOUNDRY cleaning room. Upper figures are average noise levels before noise abatement program. Lower figures show results obtained in reducing noise.

WHEELABRATOR hopper with liner and coating of deadener on outside.



GUARD with wood baffle barrier on it in front of tumbling barrel raised to show pads under footings and coat of deadener on outside of barrels. Baffle on ends of guards also is shown.

Wheelabrators. Another noise source was the operation of placing castings into the hoppers for the two wheelabrators. Although this noise is intermittent, its intensity had caused employees to complain about the noisiness of this operation above all others in the cleaning room.

A three-layered liner, consisting of ¾-in. soft wood, ¾-in. oak, and 10-gauge perforated sheet steel, was installed in each hopper with bolts which have washers and bushings of the same material used on the tumble barrel mountings. After six months there was no indication that maintenance of these liners would be a problem.

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Summary of Application and Costs	Installation Material	Installation Costs	Total
1. Reduced vibration transmission from tumbling barrels by installing composition bushings at the footings of these machines.	$ 130	$ 231	$ 361
2. Installed wood liners in bottoms and backs of wheelabrator hoppers. These liners were covered with sheet metal to insure longer life. They are separated from the hoppers by composition bushings and washers on the bolts.	86	215	301
3. Treated all the trays with rubber-base sound deadener, spraying four sides on the outside and the bottom of all trays with a coating approximately ⅛ in. to ¼. thick. Treated the outside of the tumbling barrels and outside of wheelabrator hoppers with the same deadener, sprayed to a thickness of ⅛ in. to ¼ in.	150	171	321
4. Installed noise baffles at the front of the four tumbling barrels.	60	74	134
5. Installed glass-fibered, plastic-lined sound absorbing baffles in the ceiling area.	1074	380	1454
6. Installed special tool rest and arbor washers on grinders.	14	28	42
	$1514	$1099	$2613

Prominent Speakers Head Congress Roster

Sections announce meeting plans, speaking talent for the 44th edition of safety's biggest convention, October 22-26

FOR its first appearance at a National Safety Congress the Council's Labor Conference has lined up an impressive program for the 44th meeting of safety's biggest convention October 22-26.

Scheduled speakers for the Conference's morning session on Wednesday, October 24, are George Meany, president of the American Federation of Labor and Congress of Industrial Organizations; Adm. Ben Moreell, chairman of the board, Jones and Laughlin Steel Corporation, and the Very Rev. Msgr. George G. Higgins, director, Department of Social Action, National Catholic Welfare Council, Washington, D.C.

President of the AFL from 1952 until his election as head of the world's largest labor organization when that union was united with the CIO in December 1955, Mr. Meany will speak on "Labor Wants to Cooperate in Safety."

Active in trade unionism since he joined the Plumbers Union as an apprentice in 1915, Mr. Meany has held union offices since 1922, when he was elected business agent of a Plumbers' local in New York. He learned unionism in his home, for his father was president of a unit of the Plumbers' organization. He came up through the ranks in the New York state AFL and was president of that body when he was elected secretary-treasurer of the national AFL in 1940.

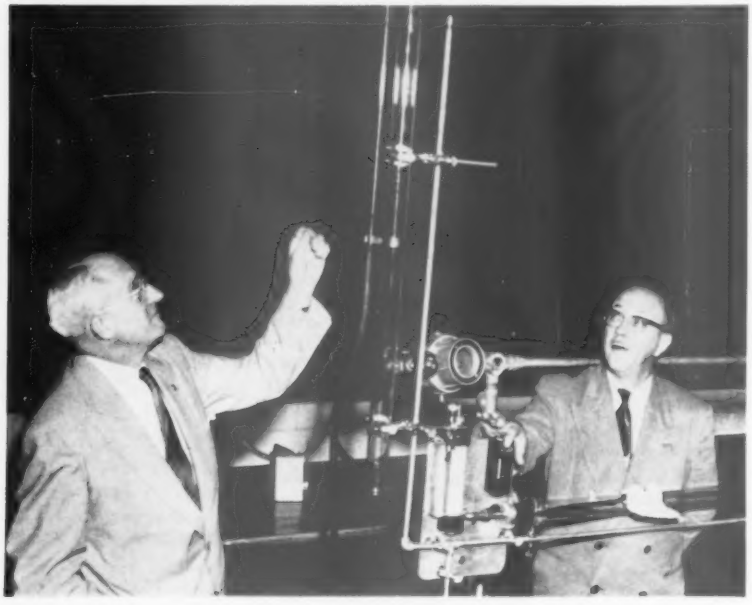
Management's viewpoint will be expressed by Admiral Moreell in his talk, "Can Labor-Management Safety Programs be Successful?"

Monsignor Higgin's address is titled "Moral Aspects of Accident Prevention."

Also on hand for the Wednesday morning session will be President Ned H. Dearborn of the National Safety Council, who will greet Labor delegates at their first formal Congress session, and Harry Read, assistant to the secretary-treasurer, AFL-CIO, and vice-president for labor, National Safety Council. Mr. Read will explain labor's expanded program in the Council.

The Labor Conference's Con-

GEORGE MEANY, president, AFL-CIO, will address the Labor Conference's initial Congress sessions on Wednesday, October 24.



ELECTRICAL Equipment and Petroleum Section delegates will see this dramatic demonstration on flame propagation and explosion-proof equipment by G. M. Kintz (left) and H. F. Brown of the U.S. Bureau of Mines.

gress plans also include a labor safety workshop (or panel discussion) for Thursday morning, October 25.

Other sections of the Council's Industrial Department have scheduled varied and informative meetings, discussions, and demonstrations as follows:

Mining Section. Speaking at the Monday afternoon program will be Duncan A. Holaday, sanitary engineering director and chief, Occupational Field Health Station, Division of Special Health Services, U. S. Public Health Service, Salt Lake City, Utah. His topic will be "Medical Phase of Radon Hazards." J. Disley, mine superintendent, Hollinger Consolidated Gold Mines, Ltd., Timmins, Ont., will speak Monday on "Job Hazard Analysis."

On Tuesday, delegates will hear R. W. Edwards, superintendent, Morris Mine, Inland Steel Co., Ishpeming, Mich., discuss "Improved Safety and Operating Efficiency with Sound-powered Phones."

Thursday's feature will be a symposium on safety gadgets.

Electrical Equipment. "The Mysteries and Hazards of Radio Frequency Energy" is the title of the talk by Leon W. Rustad, supervising engineer, Airborne Electronics, Air Arm Div., Westinghouse Electric Corp., scheduled for Wednesday afternoon.

A dramatic demonstration on flame propagation and explosion-proof electrical equipment will be given Thursday afternoon by G. M. Kintz, district supervisor, Health & Safety District G, U. S. Bureau of Mines, Dallas, Tex. This same demonstration will be presented at the Tuesday afternoon meeting of the Petroleum Section.

Petroleum Section. Robert Rutherford, materials handling and packaging project engineer, Sun Oil Co., will give an illustrated lecture Tuesday on "The Use and Safety of Modern Materials-handling Equipment."

On Wednesday, C. E. Booz, head of accident prevention unit, Gulf Oil Corp., will address delegates on "Safety Meetings—But Why?" On the same program is a panel discussion on management leadership in accident prevention. Four participants will tell what they would do to encourage it. Also on Wednesday, is scheduled a talk by Ray E. Blank, Petroleum Chemicals Div., E. I. duPont deNemours and Co., on "Disaster and Emergency Procedures."

A panel discussion on off-the-job safety will be a feature of Thursday's program.

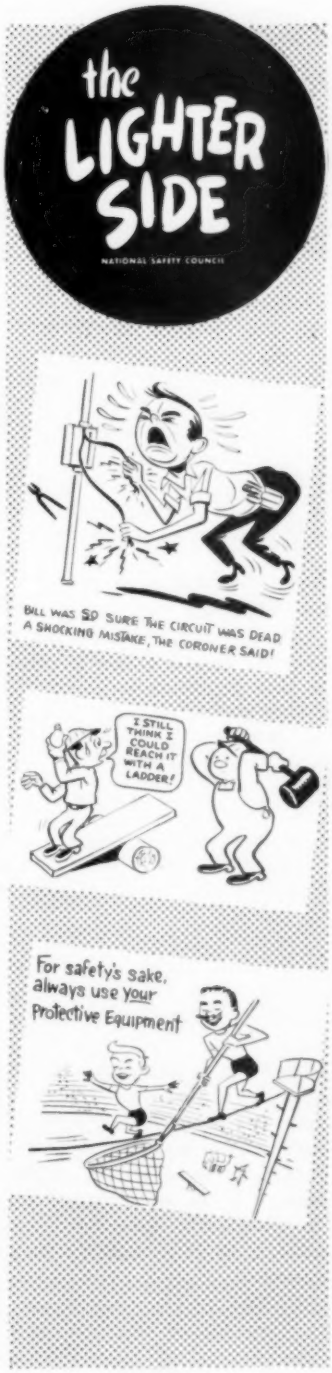
Meat Packing, Tanning, and Leather Products Section. Back by popular demand after his appearance at the 43rd Congress will be Clayton Orcutt, who will speak Monday afternoon. Coordinator of the Supervisory Institute at the University of Wisconsin and widely known in industry as a safety lecturer, Mr. Orcutt will speak on "Build It In—Don't Tack It On."

Another Monday afternoon speaker will be Paul Jones, Director of Public Information, National Safety Council, whose talks on safety are so popular that he finds it impossible to fill all requests for speaking engagements. Mr. Jones' Congress talk is titled, "We Can't All Play the Piccolo!"

On Tuesday afternoon delegates will hear an address, "Safety Begins at Home," by May M. Roach, associate director of rural education, Central State College, Stevens Point, Wis. Professor Roach is noted for her work with local councils in Wisconsin.

The Exposition. As in other years all exhibition space for the 44th Congress was allocated on the first day it was announced. One hundred eighty-eight commercial exhibitors will display their products in 247 booths. Lack of space made it necessary to reject several applications.

New and more convenient floor space has been reserved in the Conrad Hilton Hotel for this Congress' eight educational exhibitors. Formerly on the third floor, these displays this year will be in the lobby between the north and south halls. Included among the educational exhibits will be booths manned by the American Academy of Ophthalmology, American Red Cross, Federal Civil Defense Administration, Inter-American Safety Council, Inc., National Society for the Prevention of Blindness, Center for Safety Education (New York University), and the Strategic Air Command.


the LIGHTER SIDE
NATIONAL SAFETY COUNCIL
BILL WAS SO SURE THE CIRCUIT WAS DEAD A SHOCKING MISTAKE, THE CORONER SAID!
I STILL THINK I COULD REACH IT WITH A LADDER!
For safety's sake, always use your Protective Equipment

SAMMY SAFETY'S NOTEBOOK

By Arthur S. Kelly
Industrial Department, NSC

July's Winner

Winner in July was H. G. Honig, superintendent, Street Lighting, Construction, and Maintenance Department, City of Los Angeles, whose idea for a safety arm for cable spools was selected as the month's best despite the fact that the identifying captions were inadvertently switched.

These Awards Are Waiting for You

Last month we mentioned the type of ideas we'd like to receive for this department — homemade devices which have solved a hazardous operation or exposure to mechanical equipment.

This month we thought we'd show you the awards. Perhaps some new readers haven't seen how much he can win for one little idea—when judged best for the month.

The monthly award will be your choice of a Parker "51" standard fountain pen or a handsome lighter of Italian black and gold marble.

The semi-annual award for the best idea submitted during the preceding six months will be your choice of the beautiful desk clock or one of two luxury billfolds—either ostrich or alligator hide. The six-months' award will be in addition to any monthly award presented.

Metal Strap Holder

This metal strap holder prevents injury from flying bands when a steel strap is cut. Made of 20 gauge steel, the holder is 12 in. x 4 in. on the top section and 8 in. x 4 in. on the side or bottom section. The handle is riveted on the top side.

Submitted by Stuart Mansfield, Western Printing & Lithographing Company, Poughkeepsie, N. Y.

Door Lights

The refrigerator section of the packing plant where this idea originated is full of swinging doors. Even though the doors had windows, three accidents involving employees being struck by these doors occurred in a short period. Apparently the lighting was insufficient.

One of the company engineers came up with the idea of a brilliant light outside each door. Elementary? Sure, but it has eliminated this type of accident.

Submitted by Norman Kirk, safety director, Canada Packers, Limited, Toronto, Ont.

Farthest North Award

AWARD OF HONOR PENNANT flaps in white Labrador skies as Clyde G. Newcomb (standing in center, left), Drake-Merritt project manager, accepts plaque from Wendell R. Blair, representative, Industrial Department, NSC.

Two AWARDS of international significance have been presented to Drake-Merritt, joint venturers on a Corps of Engineers project at Goose Bay, Labrador. The Award of Honor, highest mark of distinction conferred by the National Safety Council, was presented to the joint venture firm for their safety record during 1955. It was the farthest north presentation of this award to date.

In addition, the Associated General Contractors of America, made a second place Award of Merit in the Class "A" Heavy Construction Division, for an exceptional accident prevention record.

Employees at the $120 million air base project worked 4,129,633 man-hours last year. More than 1,000 workers attended the presentation ceremony.

Highlight of the safety record was the absence of fatalities—the first calendar year unmarred by an accidental death since the five and one-half-year-old project was started. The safety performance was termed "amazing" in view of adverse weather conditions that had to be overcome. The year's total snowfall was 210 inches.

Wendell R. Blair, staff representative for the National Safety Council, made the Award of Honor presentation, and Harry J. Kirk, of Associated General Contractors, presented the Association's award. Both plaques were received by Clyde Newcomb, project manager for Drake-Merritt at Goose Bay.

Except for Corps of Engineers' and Contractor's supervisory staffs, the vast majority of the workmen on the project are Canadians. This is in accordance with a U. S.-Canadian agreement which specifies that working force shall be primarily Canadian.

A similar ceremony had been held previously in New York, at which the awards were presented to Robert P. Bayard, president of Johnson, Drake & Piper International Corporation, which, with the firm of Merritt-Chapman & Scott Corporation, forms the joint venture firm of Drake-Merritt.

Special commendations were presented to Col. Morton Solomon, District Engineer of the Eastern Ocean District, for the vigorous and sustained Safety program which he fosters on contract construction under District supervision. Mr. Kirk, of Associated General Contractors, when presenting the AGC commendation, made particular reference to the high quality of construction and safety practices which distinguished U. S. Army Corps of Engineers-supervised projects.

Fire Research Section Formed By PCA

THE PORTLAND CEMENT Association has announced the formation of a Fire Research Section, effective June 1, 1956, to be headed by Clifford C. Carlson.

The new section, established within the Research Department of the Association's Research and Development Division, will eventually be housed in one of two new buildings planned for construction at the organization's Research and Development Laboratories in Skokie, Ill., Chicago suburb.

Mr. Carlson, formerly manager of the Products and Applications Section, Development Department of the Association, is currently engaged in planning of the Fire Research Center. Together with a Structural Development Laboratory, the building is part of a $1.8 million construction program aimed at providing facilities for the Association's expanded research program on concrete structures and the fire resistance of concrete. Completion of the buildings is scheduled for 1957.

Carlson holds a Master of Science degree in Mechanical Engineering from the University of Minnesota. He joined the Research and Development Division of the Portland Cement Association in 1935.

In 1946 he was appointed manager of the Structural Development Section, and in 1952 manager of the Products and Applications Section of the Development Department. He has been closely associated with the Association's fire testing program at Underwriters Laboratories, Inc. in Chicago, since its start.

Replacing Carlson as manager of the Products and Applications Section will be Joseph J. Shideler, who for the past three years has served as development engineer in the section.

SHOWMANSHIP IN SAFETY

By B. J. O'Brien, *Public Information Department, NSC*

Good Taste Leads To Good Showmanship

The Mail Order Journal once said that "showmanship is merely another name for the well-known advertising principle of getting attention." However, in some quarters it seems to be the fashion to confuse showmanship with rather dreadful slapstick comedy. This method, at least in the long run, fails to pay dividends and consequently loses appeal.

The element of the unusual is seen in most instances of good showmanship. Any little stunt that you think to be unusual, provided it is dignified and sensible and pertinent to your safety program, is most desirable for "Showmanship in Safety."

To compete in our "Showmanship" contest, just send us a story and pictures of a safety stunt that in your opinion is a sure-fire approach to employee interest. If you win, a handsome Ronson Adonis cigarette lighter will be yours. Remember, the idea doesn't necessarily have to be your own, but must be submitted by you. By winning our monthly contest, you become eligible to win the Showman-of-the-Year award, a Parker "Magnetix" desk set with two "51" pens.

Send your idea to B. J. O'Brien, "Showmanship in Safety," NATIONAL SAFETY NEWS, 425 N. Michigan Ave., Chicago 11.

July Showman-of-the-month— Albert L. Phillips

For reporting the Michael Schiavone & Sons combination safety and incentive system, Albert L. Phillips, executive director, New Haven (Conn.) Safety Council, becomes the sixth Showman-of-the-Month award winner.

Mr. Phillips will receive a Ronson Adonis cigarette lighter and thus qualifies to compete for the Showman-of-the-Year award.

Blackboard Idea Gets Good Results

A blackboard and a piece of chalk, mixed with some artistic talent and some good ideas proved to be an able safety seller at the Wilson & Toomer Fertilizer Company, Jacksonville, Fla.

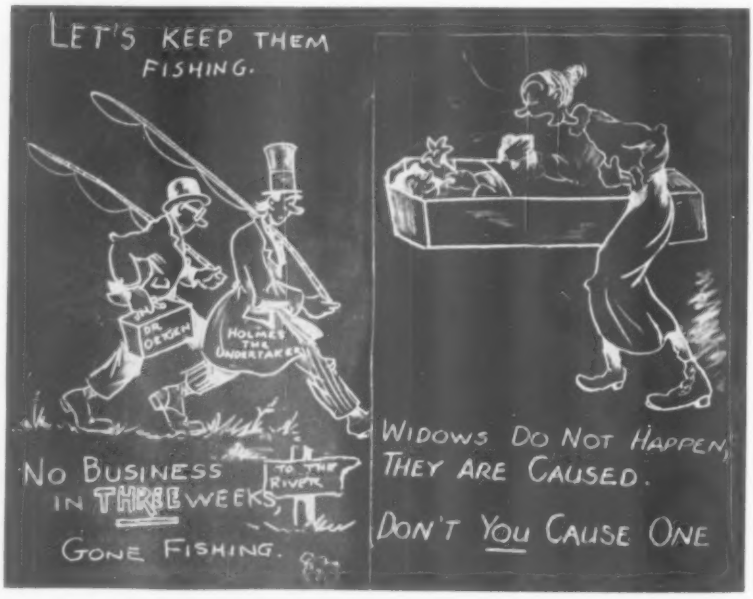
W. T. Williams of Jones & Hill Insurance Agency submits this "easy to do" safety idea. Here's how it works: When a worker had an accident, a cartoonist version of the accident and the name of the person having the accident were drawn on the blackboard where all could see it. In time, employees began to pay particular attention to those workers having their picture on the blackboard.

Since none of them wished to see themselves on the board and feared to have others see their accident in cartoon form, they began to show more attention to the prevention of accidents. Soon the number of mishaps began to decline and the company believes this unique medium helped.

Mirror Sticker Wins First Prize at Exhibit

Seth Jackson, safety officer, United States Department of Agriculture, Forest Service, reports that at a recent Boy Scout exhibition a mirror safety sticker won first prize.

The sticker, bearing the words, "Am I looking at a person who is doing all he can to prevent accidents?" was placed on a mirror in a box, with a large opening on the opposite end labelled, "Look in here then answer the $64,000 question." It caught the eye of people attending the exhibit and indicated that even the simplest device can help prevent accidents.


LET'S KEEP THEM FISHING.
SIR OSCAR
HOLMES THE UNDERTAKER
NO BUSINESS IN THREE WEEKS, TO THE RIVER
GONE FISHING.
WIDOWS DO NOT HAPPEN, THEY ARE CAUSED.
DON'T YOU CAUSE ONE

FIRE CONTROL demonstration at Industrial Safety Institute sponsored by the Hawaii Employers Council at the Queen's Surf restaurant, Honolulu. The men in neckties are Edward M. Freyer, coordinator (middle) and Robert Alden, leader (extreme right).

An Island Paradise Has Accident Problems

Safety institutes, led by representatives of leading industries, are spreading accident prevention know-how through Hawaii

By EDWARD M. FREYER

THOUGH the islands of Hawaii lie 2,300 miles across the deep blue Pacific from California, Hawaii is no foreign shore. Despite its highly publicized native charm, palm-fringed beaches, and still active volcanoes, it is strictly American.

EDWARD M. FREYER is with the Hawaii Employers Council, Honolulu.

But accidents do happen—even in paradise. Its people, like those elsewhere in our nation, face accident-prevention problems. Similarly, they cooperate in groups to accomplish what they cannot get done as individuals. One of our latest cooperative ventures sprang from the needs of a group of industrial safety engineers. It has been received with enthusiasm by industry and is producing good results.

To get a basic idea of the safety situation in Hawaii, let's consider the Territory's biggest industry . . . sugar. Our sugar plantations, including both the growing of sugar cane and the sugar mill operations which convert the cane into raw sugar, have steadily cut their

—To page 107

ABRASIVE BLASTING

Published by National Safety Council
425 North Michigan Avenue, Chicago 11

1. Abrasive blasting is a process of cleaning or preparing a surface by forcibly applying (blasting) abrasive material to it. Common abrasive materials used for this purpose are sand (sandblasting), steel shot, carborundum, granular aluminum oxide, and various organic grits, such as ground walnut shells, ground corncobs, and similar materials.

2. The uses for this process vary all the way from heavy industrial cleaning of steel castings, steel plate, and similar materials, and cleaning of mill scale from steel plate to application of decorative finishes (by use of stencils) on various materials. A common use in construction is the cleaning of building exteriors.

Methods of Application

3. There are six distinct methods for applying the abrasive material. They are:

a. Standard dry abrasive blasting. Dry abrasive is applied by the force of compressed air.

b. Wheelabrator blasting. Dry abrasive is propelled by centrifugal force from a spinning wheeled unit.

c. Damp sandblast or Vapor Blast. Silica sand with a metered amount of dampening liquid is propelled by air.

d. Wet sandblasting. Sand is mixed with water and propelled by compressed air.

e. Hydro-sandblast. Sand is mixed with water and propelled by water pressure.

f. Liquid blasting or Hydro-finishing. Extremely fine sand is suspended in water and propelled by air.

Hazards

4. The general hazards of industry, such as those created by poor housekeeping and unguarded moving parts, are encountered in abrasive blasting. Standard preventive measures should be taken to control these hazards.

This Data Sheet is one of a series published by the National Safety Council, reflecting experience from many sources. Not every acceptable safety procedure in the field is necessarily included. This Data Sheet should not be confused with American Standard Safety codes, federal laws, insurance requirements, state laws, rules and regulations, or municipal ordinances.

5. Danger from flying abrasives is a constant problem, which must be controlled by proper enclosures and proper personal protection.

6. In the application of dry or damp abrasive propelled by air, static electricity can accumulate on the operator's body. To control this problem, a properly grounded conductive hose should be used.

7. Abrasive blasting barrels may produce noise above desirable limits, requiring isolation, separate room enclosure, foundation pads, or other standard anti-noise treatment.

8. In the cleaning of toxic metals such as lead or the removal of toxic surface materials such as lead, mercury, cadmium base paint, or zinc, toxic dusts are an inherent hazard. Normally, the ventilation requirements for sandblasting are more than adequate to reduce such toxic dust below the maximum allowable concentration. Respiratory protection should be selected and used with particular care on such an operation.

9. The dust hazard is the major hazard in abrasive blasting and completely dwarfs all others. The remainder of this data sheet is largely a discussion of this hazard. While control of this dust is essential from the standpoint of health, it is also important to industry because abrasive dust will damage moving machinery.

Choice of Abrasive

10. In abrasive blasting, the major dust hazard is from sandblasting or from cleaning of sand from castings. This is a serious hazard because sufficient silica dust breathed into the human lungs causes silicosis, which may become totally disabling.

11. Dust smaller than the naked eye can see is the real problem. Dust under 5 microns is considered the most dangerous. (One micron is 1/25,000 inch.) The probable safe concentration for an 8-hour exposure has been established at 5 million particles of free silica per cubic foot of air.

12. The most simple, but not necessarily complete, control of the silica dust problem is substitution of another abrasive. This solution can usually be justified on a financial, as well as a health, basis. The substitute abrasives often give better performance than sand and require smaller handling and ventilating systems, further cutting costs.

13. If sand must be used as the abrasive, high silica sand should be used rather than bank or river sand, if possible. Silica sand does not break as readily; thus much less fine-sized dust is formed.

Choice of Application

14. If sand must be used for abrasive blasting on a certain operation, the method of application will determine the magnitude of dust produced. Wet methods will produce less dust and therefore are best for control of this hazard. Unfortunately, they are not suited to many operations so that the choice is likely to fall among the first three methods. The dust-laden mist which wet methods produce is dangerous, however, and must be removed.

15. Damp sandblasting or Vapor-Blast will produce about one-fourth as much dust as will dry sandblasting. For outside work (such as in shipyards), a rust inhibitor liquid may be introduced at the nozzle to serve as a dampening medium. This liquid inhibits rust on the cleaned surface for about 48 hours, thus helping to justify the added cost it entails.

16. Since wheelabrator equipment requires stationary installation, it is less adaptable to some types of work but more adaptable to enclosure. Furthermore, the fact that compressed air is not used to propel the abrasive means that there is less dust dispersion.

Control of Dust By Isolation

17. It is not feasible to enclose and exhaust certain abrasive blasting operations, such as those found in shipbuilding. Especially where dry sand is used, it is desirable to isolate the operation. As much of the blasting as possible should be done in a specified location which is as far as practicable from employees other than the operator. Another way to isolate the blasting is to do it on an "off shift" when few other employees are working.

18. The dust cloud in such an operation gives a crude idea of the location of the most seriously contaminated air. Any employee working in the area should wear a supplied-air or filter-type respirator.

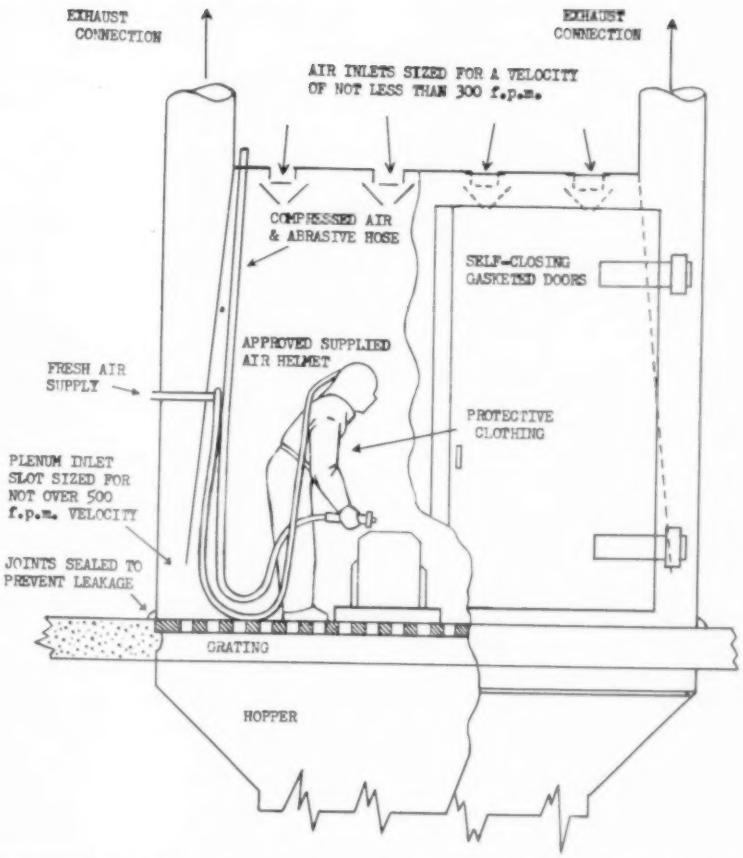

EXHAUST CONNECTION
EXHAUST CONNECTION
AIR INLETS SIZED FOR A VELOCITY OF NOT LESS THAN 300 f.p.m.
COMPRESSED AIR & ABRASIVE HOSE
SELF-CLOSING GASKETED DOORS
APPROVED SUPPLIED AIR HELMET
FRESH AIR SUPPLY
PROTECTIVE CLOTHING
PLENUM INLET SLOT SIZED FOR NOT OVER 500 f.p.m. VELOCITY
JOINTS SEALED TO PREVENT LEAKAGE
GRATING
HOPPER

FIGURE 1. Sandblast room. (Courtesy Bureau of Industrial Hygiene, Connecticut State Department of Health.)

Control of Dust By Enclosure

19. If the materials are not too large, the entire operation may be enclosed with the operator on the outside. Such enclosures include abrasive blasting barrels, wheelabrator units, hand blast cabinets, and rotary table cabinets. When an enclosure with a ventilation system which gives a strong air flow into all openings is used, there is little dust hazard to the operator or others in the area.

20. If the employee must be able to walk around the larger materials while doing abrasive blasting and the operation cannot be isolated, a room like that shown in Figure 1 must be built. Where doors are so large that it is difficult for an operator to open them, a man-door should be provided. Good lighting is necessary, and dust-tight cover globes of hard glass are preferred.

Ventilation and Exhaust Of Enclosures

21. In an enclosure for abrasive blasting, air must be exhausted rapidly enough to maintain a slight vacuum or negative pressure, so that fresh air will flow in through any leaks rather than contaminated air flow out from the enclosure. In addition, enough fresh air must be circulated to reduce the dust and provide good visibility for the operator. (This last requirement does not apply to automatic operations where inspection is made after blasting.)

22. Figure 1 shows a good installation for a sandblast room with air inlets and exhausts arranged to sweep the contaminated

air away from the worker's breathing zone. Down draft should average about 80 feet per minute over the entire floor area. Air should be exhausted from such a room either downward or on two sides of the room at floor line.

23. A less desirable but acceptable arrangement would be cross ventilation with an average velocity of 80 fpm over the vertical cross section of the room.

24. The inward velocity at all openings where dust might escape should be between 300 and 400 fpm in all types of enclosures, and all openings should be baffled.

25. Air velocity at exhaust outlets of enclosures must not be so great as to carry off good abrasive materials. The recommended maximum is 500 fpm. Baffles are necessary here also to prevent abrasive from being mechanically propelled through openings.

26. The false walls in Figure 1, extending to about 1 foot from the floor, provide a space adjacent to the room walls where heavy abrasive material can settle out.

27. The entire ventilation and exhaust system should be designed by a competent manufacturer or ventilation engineer.

Duct Work for Exhaust Air

28. Good ducts can make the difference between a good exhaust system and a poor one. All duct work should be well designed and have regular and rigid inspections to find leaks or plugging. Air should flow through all ducts at 3,000 to 4,000 fpm to prevent deposits of dust.

29. Ducts should be supported so that there will be no sags where dust can collect. All laps in ducts should be in the direction of air flow. Airtight cleanout openings should be provided adjacent to every bend and every vertical riser and every 20 feet or so of straight run. All bends should have a *minimum* radius of twice the pipe diameter and be of heavier gauge metal to reduce leaks. Ducts should be placed where they will not be damaged by cranes, hoists, industrial trucks, or other equipment.

30. Plugging may be detected by tapping the top of a duct with a hammer while the fingers of the other hand rest lightly on the bottom of the duct to feel the vibration. A method of determining air velocity in the duct is explained in *Safety in Sandblasting*, published by Industrial Hygiene Foundation of America, Inc., and in Data Sheet D-431, "Instruments for Testing Exhaust Ventilation Systems," published by the National Safety Council.

Collection of Dust

31. In rare cases where high efficiency is desired, dust is collected by electrostatic precipitation, but the common collectors are cloth dust filters, "wet" or washer-type collectors, and cyclone collectors.

32. It is never desirable to allow exhausted air to be recirculated where employees may breathe it again. If it must be recirculated, the air from the collector should be no more contaminated than is the general air in the room to which it is returned, and special precautions should be taken to keep the efficiency of the collector as high as it is at the first test.

33. Cyclone collectors depend on centrifugal force to precipitate the dust from the air. For this reason, the lighter the particle, the smaller the chance of its being removed from the air stream.

34. This type of collector may be used if effectively isolated (placed on the outside of buildings) so that exhaust from it will be extremely diluted with fresh air before it reaches the breathing zone of any worker.

35. The cyclone type can be used effectively to collect larger particles before exhaust goes to a cloth filter. A settling chamber may also be used for this purpose.

36. Cloth collectors are more effective in filtering micron size particles. Since these smaller particles are of utmost importance, this method is considered the most desirable. Filters must be shaken regularly to remove dust. Exhaust fans must be turned off before these filters are shaken, unless they are of the type which is continuously cleaned by a reverse flow.

Abrasive Recovery And Separation

37. Recovery of abrasive is simplified if a recovery hopper, like that shown in Figure 1, is used. Each time the abrasive is re-used, it becomes finer, dustier, and more inefficient. Thus, after recovery, an effective separation system is necessary. Here, the abrasive is dropped and "fines" are blown out to be exhausted to the collector. Grasping a handful of abrasive and letting it spill from the side of the hand is a rough means of discovering any large amount of fines.

Abrasive Handling And Storage

38. Unless no fines are present, dust is always created at any point of transfer of abrasives whether by hand shovel or from conveyor to hopper. It is important, therefore, to have all regular points of transfer, including the point where the abrasive is transferred to the storage area, properly exhausted.

39. Workers who handle abrasive manually should wear respirators when necessary. Any industrial hygiene survey should include a check of dust in the area of such employees.

Inspection and Maintenance

40. Good maintenance is vital to safe and efficient operation of the ventilation and exhaust system. Inspections should not be left to chance, but should be made periodically, with close follow-up on recommendations.

41. The following check list is recommended for inspection of sandblast room operations: *

a. Do doors close tightly? If not, does normal work frequently involve

*Adapted from *Safety in Sandblasting*, Industrial Hygiene Foundation of America, Inc.

directing the nozzle toward the door? (Look for dust leakage in these circumstances.)

b. Where the room frame is connected with the hopper or the floor, is the joint tight or is there some arrangement to prevent dust from leaking?

c. Is there an adequate seal at top and bottom of a hopper under the floor?

d. Are clean-out doors dust-tight?

e. Is there spillage of material through cracks? If so, does its clean-up require more than a few minutes daily?

f. Is the elevator housing, both in the pit and above floor level, dust-tight.

g. Is there any visible escape of dust from the housing of the abrasive separator? (There should be none if air for the "wash" is being exhausted at the proper rate.)

h. Is there visible dust as rejected debris falls to the outside receptacle?

i. Is there a "brisk" velocity inward through rejection openings?

j. Is the exhaust duct free of settled material?

k. Does the pressure release valve on the abrasive pressure tank operate in a manner to prevent escape of dust to the atmosphere?

42. Maintenance of curtains in rotary table cabinets is frequently overlooked to such an extent that this method of dust control becomes ineffective.

Use of Respirators

43. For an operator working in an abrasive blast room or where there is no enclosure, a supplied-atmosphere (or air-fed) respirator is essential. The dust hazard to the operator is controlled more effectively by his wearing a suitable respirator than by any other precaution.

44. The operator should use only a Bureau of Mines approved helmet unit for this work. Helmet, hose, and regulator are approved as a unit. Any such unit not marked "B.M.," followed by the approval number, should not be accepted.

45. Loose-fitting helmets require a minimum of 6 cubic feet per minute (cfm) to prevent dust from entering. Tight-fitting helmets require 4 cfm. All approved regulator valves available to the operator are adjustable within a certain range only. When the valve is completely closed, the helmet must receive a minimum of 2 cfm to get approval. Since this amount is insufficient to control dust, employees must be closely supervised to see that they receive adequate air.

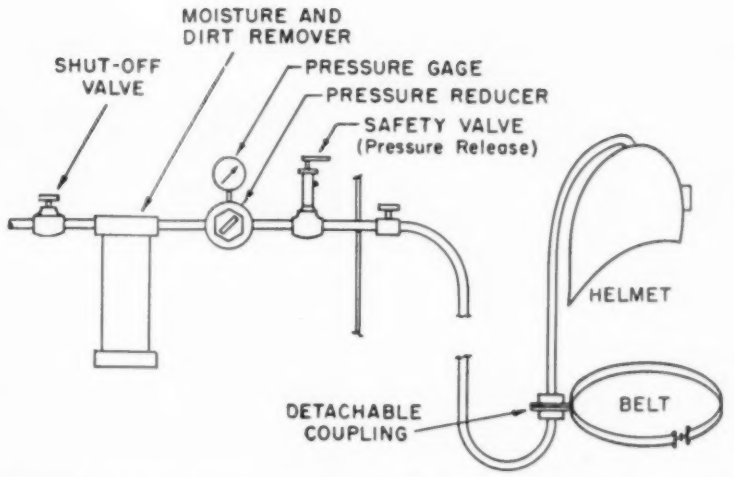


FIGURE 2. Suitable arrangement of air supply valves, pressure gauge, etc., for high pressure air. Independent low pressure air supply unit is, however, preferred. (From *Safety in Sandblasting*, published by Industrial Hygiene Foundation of America, Inc.)

46. This problem exists largely in cold weather when the air has a cooling effect. In some cases, it is feasible to heat this air and thus reduce the problem. An electric resistance heater may be used for this purpose. Where considerable trouble is experienced, the regulator can be locked. Then, only the supervisor can change the setting.

47. If possible, air should be supplied from a separate compressor or fresh air blower (not of the reciprocating type), rather than from the ordinary shop line. The chance that oil or carbon monoxide may be in the air supply is thus eliminated.

48. If it is not possible to use a separate compressor or blower, the arrangement shown in Figure 2 is recommended. The air supply should be carefully checked for carbon monoxide at frequent intervals (daily). The supply line uses ½-inch hose.

49. The noise level in the operator's hearing zone should be checked. Nonmetallic helmets create less noise. Certain fresh air compressors or blowers are far less noisy than others. Orifices for bringing a[illegible]met should be shaped to minimize noise. A generally accepted maximum level for broad spectrum noise (noise of this kind) is 90 decibels.

50. Employees exposed to only a small dust hazard, perhaps from working in the area but not in the operation, can be protected by a filter type respirator. The respirator must be approved by the U. S. Bureau of Mines for the specific dust.

51. In an extremely dusty atmosphere, dust is rapidly deposited on the filter so that breathing becomes difficult. In this event, the employee should change to the air-supplied type of respirator.

Cleaning and Maintenance Of Respirators

52. Respirators should be sterilized at least once a week in a standard solution approved by ASA Code Z2, *Protection of Heads, Eyes, and Respiratory Organs.* The same employee should then wear the respirator until it is again sterilized.

53. At the end of each day, respirators, and especially the face pieces, should be cleaned with soap and water. Defective parts should be replaced then.

54. In practice, it is most effec-

tive to have one man (for instance, the tool room attendant) assigned permanent responsibility for cleaning and sterilizing respirators.

Other Personal Protective Equipment

55. All employees engaged in abrasive blasting must wear gloves. Rubber gloves (and sleeves) are generally used. Leggings and aprons are also available to protect the operator and his clothing. Split aprons can be purchased with spring clamps which fasten the bottom of the apron to the legs. Where heavy materials are to be handled, employees should wear safety shoes.

Mechanical Precautions

materials. The
maximum is 500
e control "dead-
ve should be provided. Then, the blaster has complete control at the nozzle and can start and stop the blasting with one hand. If he should drop the nozzle, the deadman valve will automatically shut off the blasting.

57. The nozzle should be externally attached to the hose by a fitting which will positively prevent accidental disengagement. No adjustment of the fitting should ever be attempted while the abrasive is flowing. Lengths of hose should also be joined by external metallic connectors so that the flow of the abrasive will not erode and weaken the couplings.

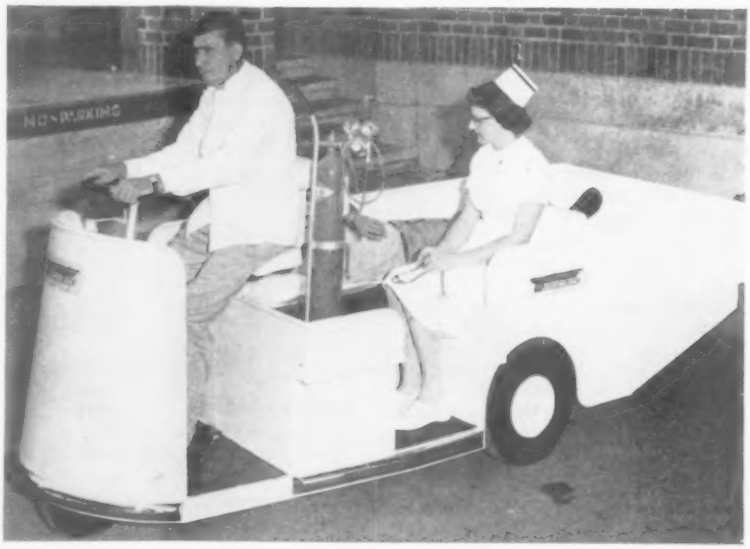
58. Positive means of signaling and a series of signals which are clearly understood by both should be maintained between the blaster and the machine operator.

59. Machines and hoses should be inspected at least weekly, and all parts showing excessive wear should be repaired or replaced.

Housekeeping

60. General good housekeeping practices should be followed in abrasive blasting operations to prevent slips, trips, and falls. In addition, the problem of dust must be handled. The vacuum cleaner is the only solution. Since dust will settle out of the air onto overhead pipes, truss members, and other parts of the building, these parts must be vacuumed on a regular basis, also.

Ambulance Goes Anywhere



THIS HANDSOME electric-powered ambulance (or litter car) is the latest addition to the line of Westcoaster Industrial Cars manufactured by West Coast Machinery, Inc., Stockton, Calif.

This unit could spell the difference between life and death for a seriously injured employee. An injured person won't have to wait *or* walk for aid. It provides room for a driver, attendant (or nurse) and the patient. In addition, there is ample space for stretcher, oxygen equipment, medical bag, etc.

Designed for use both inside and outside of plant or institution, its electric power plant means silent operation. Three-wheel design and consequent sharp turning radius permits access to narrow corridors. Cushioned tires, extra coil springing, and two shock absorbers insure a comfortable ride. Torsion bar suspension provides the car with extra ground-hugging stability. Power is transferred through on automotive-type differential drive.

The ambulance is always ready to go with all-day operation assured by six heavy-duty batteries operating at a cost of four or five cents a day. A built-in recharger quickly builds power back up to peak working capacity.

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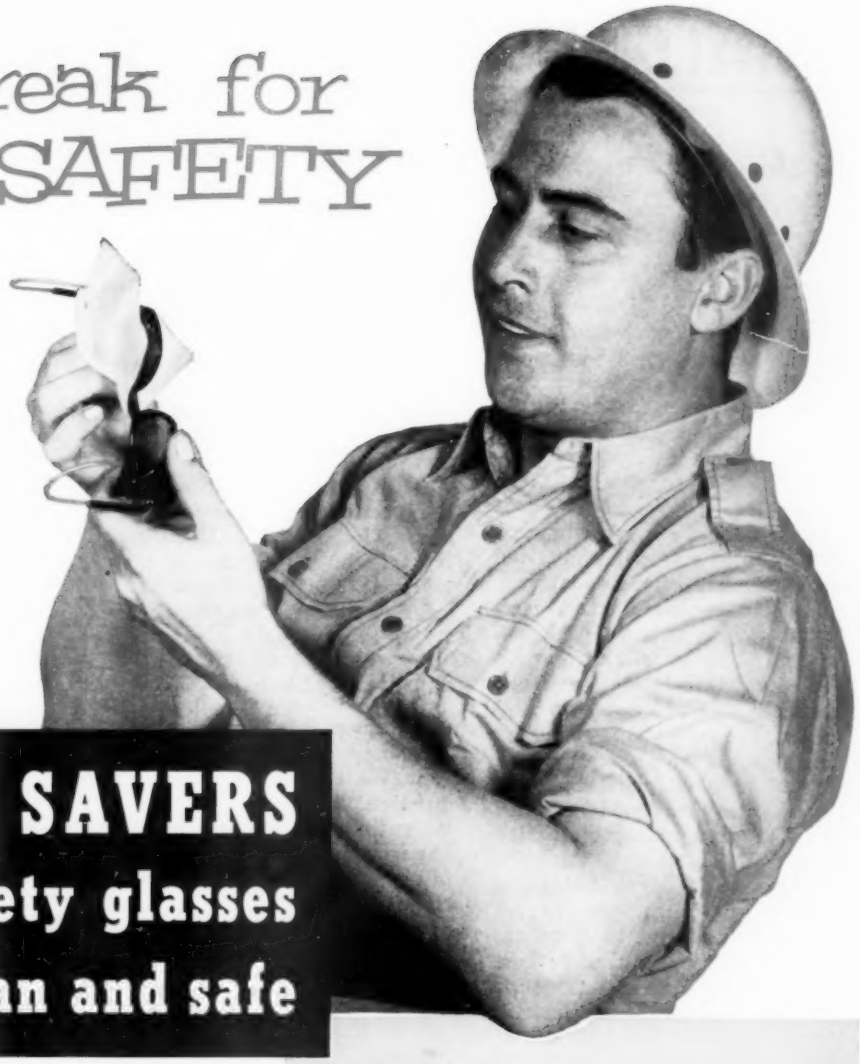
ACKNOWLEDGMENT

This data sheet was prepared by L. P. Howard of the Western Pennsylvania Chapter, American Society of Safety Engineers. It has been reviewed by members of the National Safety Council and representatives of chapters of ASSE. It has been approved for publication by the Publications Committee of the Industrial Conference of the National Safety Council.

Best break for EYE SAFETY



SIGHT SAVERS keep safety glasses clean and safe

Cleaning Stations (value $2.50 ea.) **FREE** with your purchase of SIGHT SAVER tissues.

SIGHT SAVERS are the silicone-treated tissues known and preferred by millions as the easiest, most efficient way to clean and polish eyeglasses. Put **SIGHT SAVERS** at everybody's fingertips — they wipe away the best excuse ever given for not wearing safety glasses... improve morale and efficiency.

SIGHT SAVER Cleaning Stations are . . .

- Compact, save space—overall size 3½ x 8".
- Easy-to-install—screw or adhesive mounting.
- Easy-to-use — no fuss, no fluid — dispenses just one ready-to-use 3 x 7" tissue at a time.
- Easy to maintain—just insert refills of SIGHT SAVER No. 65 tissues as needed.
- Attractive looking—steel construction, foolproof mechanism.
- Available in 3 colors—safety green, white and black.

Distributed through leading Safety Supply Houses

Install SIGHT SAVER Cleaning Stations at convenient locations throughout your plant and offices

FREE for your personal use—handy Dispenser Pak containing 200 large 3 x 6" SIGHT SAVERS — Write Dept. 8008.

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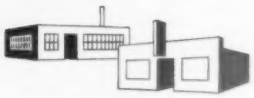
SMALL BUSINESS and ASSOCIATIONS



By A. M. Baltzer and Robert D. Currie
Small Business Program Staff, National Safety Council

How Would You Run THIS Contest?

Some associations whose membership is made up of very small companies with, say, fewer than 50 employees, are faced with the problem of maintaining interest in safety. One of the standard solutions is a safety contest.

The obvious obstacle in conducting such a contest using frequency rates as a criterion is the small number of man-hours accumulated in these small companies. In a year's time the frequency rate is usually zero or it's sky high. Only one injury can cause the frequency rate to skyrocket. Frequency rate reduction thus is not always a practical indicator, as chance variations play havoc with both good and bad records over a reasonable period of time.

We've a few ideas, but we're open for more suggestions to give to associations and local groups which want to include these smaller firms when conducting industry-wide or local contests. Do *you* have any good ideas concerning this problem? We'll publish the most practical ideas on this page in the future.

Powerful Stuff

The Educational Council of the Graphic Arts Industry recently distributed 10,000 flyers promoting the industry's safety training kit produced by the National Safety Council in cooperation with the Educational Council expressly for the Graphic Arts Industry.

Accompanying the flyer was a bulletin showing proof positive that a safety program means dollars in the prospect's pocket. The proof was made up of statements from five members testifying to actual dollar savings resulting from reduced compensation insurance costs because of a favorable accident experience. This one mailing tells a mighty powerful story. It brings home the point that preventing accidents is just good business.

The Folding Paper Box Association also distributed the flyers attached to its monthly *Safety Bulletin*. Between these two groups a lot of attention was directed to preventing accidents in the printing and related industries. This, too, is good business for our business because these industries include thousands of small businesses which we are trying to reach.

Small Firm Saves $ $ $

An automobile agency employing about 40 persons in upstate New York has always been progressive. The agency's manager states that, "Overhead is of prime importance in such a competitive business as ours. A favorable accident experience has cut our overhead several thousand dollars in 10 years time."

HUB SULLIVAN, left, Carolinas Branch, Associated General Contractors, welcomes Ivan LeGore, center, chairman of the Small Business and Associations Committee and safety director, Portland Cement Association, and Howard Schulte, U. S. Corps of Engineers, to the 26th Annual North Carolina Safety Conference where the two spoke to some 95 delegates attending the Construction Section session co-sponsored by AGC.

One of the easiest ways to reduce overhead in this business—or any business—is to reduce accidents. This automobile agency is now enjoying a 23 per cent credit on its workmen's compensation insurance which amounts to about $900 a year! This is no small saving. In the past 12 years, the agency's favorable accident experience has resulted in credits which averaged about 14 per cent—a total saving of about $4,500. You bet—safety pays—even with only 40 employees!

Brainstorming

We've read a lot about brainstorming sessions recently although it isn't a new technique. Brainstorming is a mental exercise—picking up ideas without jumping to conclusions; sort of a bull session with a purpose. Industry is using it with great success. So did the Gray Iron Founders Society at a recent meeting of its safety committee in Cleveland where one of your authors helped brainstorm "specific safety program projects" for the Society.

The committee "brainstormed" 131 ideas in 60 minutes! Some were good, some not so good and some were excellent. The important thing was the pooling of the best ideas for a well planned, long range safety program for the Society.

Whether you "brainstorm" or not, you can count on the National Safety Council staff and Small Business and Associations Committee for a great deal of help on your industry's accident problems.

Congress Program Set

On October 24 there will be another Safety Exchange session for association executives, local safety council managers, insurance engineers, and section officers interested in helping crack the small business problem.

MEMO:
TO MANAGEMENT

*Ordinary shoes are costing American industry millions of dollars in lost time injuries every year.

Why not stop this waste with a safety shoe program? You can now get maximum toe protection and comfort afforded by the new improved WINGUARDS in your safety shoes . . . ranging from the finest dress oxfords to heavy duty work boots.

SAFETY BOX TOE COMPANY
812 STATLER BUILDING
BOSTON

*SHOES WITHOUT SAFETY STEEL TOES

SAFETY OFF THE JOB

Suggestions for company and community programs

By GRANT O. SHIBLEY

NSC Staff Representative, OTJ Safety Committee

Off-the-Job Safety Committee

In carrying out its responsibility for safety in every field, the National Safety Council seeks to encourage industry to engage in off-the-job safety activities. The Off-the-Job Safety Committee of the Industrial Conference counsels and assists in this effort.

Off-the-job safety programs are those carried on by industry among its own employees designed to promote the safety of those employees and their families 24 hours a day. This type of program, therefore, is concerned with traffic, home, school and recreation safety, but the distinguishing characteristic of off-the-job safety activities, according to this definition, is that the worker is reached through his employment. Thus, off-the-job safety is an industrial safety activity, and the Industrial Conference is concerned with it.

Through the efforts of the Off-the-Job Safety Committee, the National Safety Council offers a kit of off-the-job safety program materials, including a program outline and suggestions for carrying on such a program.

The Committee seeks to promote activity in this field by various other means. The chairman and other members of the Committee have made numerous talks on the subject before all sorts of groups, and have personally engaged in numerous efforts to promote the cause.

OFF-THE-JOB ACCIDENT EXPERIENCE, FIRST FOUR MONTHS, 1956

	Group I		Group II	
NO. EMPLOYEE MONTHS	4 mos. 330,179		4 mos. 376,875	
	No.	Days Lost	No.	Days Lost
HOME	371	5039	282 (2)	
Firearms	1	26	---	
Mach'ry & Tools	30	372	22 (1)	
Fire, Explosion	8	180	6	
Toxic Material	2	8	6	
Fall, Slip	180	2975	131	
Struck by obj't	39	315	36	
Sharp Object	38	405	17	
Improper Lifting	40	448	33 (1)	
Hot Object	8	78	12	
Other	25	232	19	
TRANSPORTATION	238 (7)	4548	197 (6)	
Auto-Truck	226 (6)	4311	191 (6)	
Bicycle	---	31	---	
Motorcycle	4	15	1	
Boats	1	2	1	
Pedestrian	5 (1)	158	---	
Railroad	---	----	1	
Other	2	31	3	
PUBLIC	189	2640	152 (1)	
Firearms	5	36	3 (1)	
Sports	32	345	52	
Fight, Assault	27	321	14	
Fall, Slip	100	1694	59	
Struck by Obj't	9	120	9	
Improper Lifting	1	5	6	
Other	15	119	9	
TOTALS	798 (7)	12227	631 (9)	10443
WORK INJURIES	176 (2)	6842		

Note: Figures in parentheses are the number of fatalities included in adjacent figures.

Group II does not show break down of days.

Home Accidents in Industry

The off-the-job accident data in the adjacent chart is the actual experience of industrial workers, as reported to the National Safety Council. This information illustrates why industry is becoming more concerned about employee safety away from work and the importance of home safety as part of off-the-job safety.

In Group I, workers suffered over four times as many off-the-job injuries as they did work injuries and lost almost twice as much time because of non-work injuries. Over 45 per cent of the non-fatal injuries and 40 per cent of the days lost resulted from home accidents.

Total injury experience of both Groups I and II shows 45.6 per cent occurred in the home, 30.6 per cent in traffic and 23.8 per cent in public. Leading causes of accidents reported were as follows:

Falls in home and public	470
Auto accidents	417
Struck by object in home and public	93
Sports	84
Improper lifting in home and public	80
Machinery and tools in home	52
Sharp objects in home	45
Fight assault in public	41
Hot object, material in home	20
Fire, explosion in home	14
Firearms in home and public	9
Toxic material in home	8
Pedestrian accidents	5
Other home accidents	44
Other public accidents	24
Other traffic accidents	8

Actually, industrial off-the-job accidents are a large part of the community problem. In 1954, almost 40 per cent of the non-work deaths and over 30 per cent of the non-work disabling injuries occurred to workers off-the-job.

Frank: "They say that people with opposite characteristics make the best marriage."

George: "That's why I'm looking for a girl with money."

presenting the MSco family of extra-long adhesive bandages for Men of Industry

MSCO®

Long John®

1-INCH ADHESIVE BANDAGES

Here's *a longer* adhesive bandage that's designed *especially* for Men of Industry. It's the greatest improvement in industrial first aid since the introduction of the Unit System itself. The first and *only* adhesive bandage made a full 3½ inches in length to fit men who work with their hands and have muscular, well-developed fingers and knuckles that require a longer adhesive tape than ordinary bandages provide. This extra length plus many other outstanding features are reasons why MSco "Long John" is by far your best buy!

NONRAVEL PAD

For safety, comfort, good appearance. There are no gauze crushings or loose threads in the wound area as a source of latent infection. No unsightly, annoying threads to stick out from under the tape. Looks neat, stays neat! One of the many features of the MSco "Long John" family.

OFF-CENTER OPENING

Eliminates danger of contamination when applying the bandage. The protective covering opens off-center, away from pad, and turned-back tabs keep soiled fingers from touching the sterilized pad. In addition, the turned-back tabs make it possible to remove the covering easily and quickly.

LARGE SIX-LAYER ALL-GAUZE PAD

For better absorption, plus ample air circulation. All six layers of the pad are a full ⅞" x 1⅛"—the largest pad available. And it is *all* gauze—no cotton filler to mat or swell and cut down the circulation of air or cause the bandage to bind.

NOW... *Long John*® introduces an extra-length *plastic* adhesive bandage

Longest on the market . . . plus all the other features of the Long John family

The longest made. Fits all the way around and overlaps big fingers, knuckles, thumbs of industrial workmen. Provides a generous ¼ inch or more of overlap on most men's fingers to stay secure . . . prevents curling up at corners or peeling up at ends when hands get sweaty or oily while working. Meets the needs of *workers* . . . gives the right kind of first aid for the greatest number of industrial injuries. (According to the U. S. Department of Labor, nearly *three-fourths* of compensable injuries involve the thumb and first or second fingers of the work hand.) The "Long John" is more flexible, especially on knuckles. Can be worn longer with greater comfort. No more binding . . . prevents constriction.

MSco 1-inch Long John Adhesive Bandages available in these units:

100A—1" Adhesive Bandage, Plain or Mercurochrome, 16 per unit. $17 per 100 units.
100AW—1" Adhesive Bandage, Waterproof, Plain or Mercurochrome, 16 per unit. $17 per 100 units.
100AC—1" Adhesive Bandage, Plastic, 16 per unit. $25 per 100 units.

Write for samples

Medical Supply Company

ROCKFORD, ILLINOIS • IN CANADA, IT'S SAFETY SUPPLY COMPANY

FILM NEWS

By Nancy Lou Blitzen, *Membership Service Bureau, NSC*

Small Business

A NEW FILM just released by the National Safety Council is made expressly for showing to owners of small businesses and plants. The film uses a variation of the theme, "Accidents don't happen, they're caused." It points out that safety doesn't happen—it's caused, too!

Safety Doesn't Happen tells the story of a small firm owner who just obtained a big job contract. Some time later, his partner informs him that they might lose the contract because of an accident to one of his key employees.

After some discussion on safety responsibility, the boss decides that he is the responsible person and that some type of safety program be set up. With the help of their insurance agent and the local safety council, a simple, but effective safety program is inaugurated.

Because the company is a small operation, an elaborate or expensive program isn't necessary. Through good housekeeping, machine guarding, safe job instruction, and strong interest on the part of management, the safety program becomes a huge success.

The results become apparent in the form of greater efficiency, fewer delays, improved morale, lowered costs, and consequently fewer accidents. It proves that safety pays—and not just happens.

The film is available from the Council for purchase and free loan. It is a 16mm sound motion picture, running 16 minutes in black and white.

"I WAS HIRED to run this plant, not to play nursemaid!" Whose responsibility is it?

THE insurance agent has some good suggestions, such as machine guarding.

PEP TALKS are fine; but without some planned action, safety still won't happen.

A PIECE of lead pipe caused this. He's out for a week with a bad back. A little thing, but it might lose that big job!

THE BOSS takes an active interest by discussing hazards. He and his superintendent show their appreciation for suggestions.

"**THINGS** are running a little smoother, just a little more efficiently—and employee morale is better, too. Safety is just good business."

STOP *slipping!*

BILTRITE SAF-T-CEL SOLES

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SQUEE-GEE DESIGN

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- DuPont Neoprene oil proof
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- Available for stitched or cement shoes

Available in a variety of colors and thicknesses with matching heels and Neoprene oil proof midsoles

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AMERICAN BILTRITE RUBBER COMPANY

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WHAT'S NEW IN NATIONAL SAFETY COUNCIL SERVICES

Snake Bite Manual

Do YOU KNOW that—

Poisonous snakes are widespread—they inhabit all 48 states and can be found within minutes of Chicago's Loop or New York's Times Square.

People still die from snake bite—antibiotics are of no use against snake bite venom. Bites by large poisonous snakes on the head, shoulders or trunk are usually fatal.

Snakes can't hear—so you can shout for help as long as you stand still. They have excellent eyesight and are sensitive to ground vibrations.

Once bitten, don't try to kill the snake—movement speeds up blood circulation and spreads the venom more rapidly.

Rattlesnakes don't always rattle a warning—they may have lost their rattles or water may fill the spaces between rattles and muffle the sound.

Alcohol is no snake bite remedy—but drink as much water as you can, since swallowing may be difficult later.

Those points and a wealth of helpful information are contained in the Council's *Snake Bite Manual.*

The manual provides detailed instruction, with many photographs, on how to identify poisonous snakes, where they are usually found, safe practices and protective clothing. A chapter is devoted to field first aid, giving step-by-step treatment of snake bites. Another section provides information of particular interest to medical directors of companies which have field workers in snake-infested areas.

Prepared primarily for the use of public utility linemen, the manual also would be useful in all fields which send workers into off-road terrain, such as oil well drilling, pipeline work, lumbering and railroad maintenance of way. While snakes as a rule do not inhabit areas serviceable to man, the search for new resources, the extension of communication and transportation, and the reclamation of many areas increase the hazard of snake bite to workers in such fields.

SUCTION should be applied at once to remove venom.

The 50-page *Snake Bite Manual,* illustrated with photographs and charts and including a zoological and medical bibliography, is priced at $1.50.

Operation Safety

The September Operation Safety program—"Protecting School Children"—can readily be incorporated into your off-the-job safety program for the month.

Traffic accidents involving school children in your community may be a serious problem for your company in several ways. Time is lost by an employee who has such an accident or by the father of a child injured by an auto. Even on the job, the employee's efficiency is lowered by worry or concern after the accident.

Your company will surely want to join in a community effort to reduce the child pedestrian accident toll because of your interest in the welfare of employees' children—and of all the children in the community. From a public relations viewpoint, such participation in a community program pays off in good will.

September is back-to-school month for children. Movement to and from school exposes children to traffic dangers several times a day. Thus September is the ideal month for a child pedestrian safety program.

The September Operation Safety kit contains a leaflet with this message to drivers—"*You* Watch Out—*Children* Don't!" Warning motorists always to expect the unexpected from children, the leaflet also offers good advice to parents and teachers . . . advice that can be used by safety supervisors in an off-the-job safety program. The leaflet, attractively printed in two colors, should be given wide distribution in your plant.

Posters can also be used effectively to call attention to the child pedestrian safety program. Poster miniatures (2 in. x 3 in.) are available in mat form for reproduction in your company publications.

Other materials included in the September kit are sample news releases, an editorial, four five-minute radio interviews and a series of radio spot announcements—all of which may be adapted to your house organ or other company literature. Additional material found in this kit are traffic safety jingles, idea starters for speakers, and information on traffic safety films and film trailers.

For prices on leaflets, posters or films and on the entire Operation Safety program, write to National Safety Council, 425 N. Michigan Ave., Chicago 11.

✳ Look to this page each month for latest news about NSC services. Address request for additional information, samples or prices to the Membership Department.

JalKlamp splices

have full rope strength

Now you can cut wire rope sling costs and still get stronger, safer slings with JalKlamps, the new special alloy sleeves for wire rope splicing.

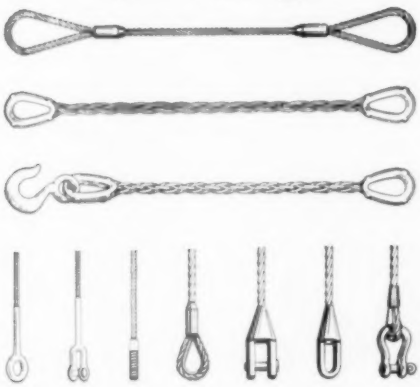
When hydraulically pressed around the rope, the JalKlamp's non-corrosive alloy actually flows into every space between the wires and between the strands of the rope. Result: a neat, permanent, watertight splice that develops the full strength of the rope.

JalKlamp slings and terminals are available in all standard wire rope constructions with diameters from ⅛″ to 2″. They're part of a full line of JalFlex Slings and Fittings including all types of braided slings and swaged fittings that can meet your individual wire rope assembly requirements.

Write for complete information on the JalFlex Slings and Fittings today.

Designs for Every Need

JalFlex Slings and Fittings



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National Safety Council awards for outstanding records

THREE TYPES of awards are given by the National Safety Council to industrial units in recognition of outstanding performance in accident prevention:

1. **THE AWARD OF HONOR** is available to units whose records, though not perfect, meet rigorous standards of excellence. These standards take into account the previous experience of the unit as well as the experience of the industry in which it operates. A unit must qualify on both frequency rate and severity rate. The Award of Honor is available also to units which complete 3,000,000 man-hours without a disabling injury.

2. **THE AWARD OF MERIT** has similar, but less exacting requirements. Minimum number of injury-free man-hours needed to qualify is 1,000,000.

3. **THE CERTIFICATE OF COMMENDATION** is available only for injury-free records covering a period of one or more full calendar years and totaling 200,000 to 1,000,000 man-hours.

Details of eligibility requirements may be obtained by writing to the Statistics Division, National Safety Council.

AWARDS OF HONOR

ACF Industries Inc., Albuquerque, N. M.

Algoma Plywood & Veneer Co., Algoma, Wis.

American Can Co., Portland (Ore.) Factory 92-A.

American Cyanamid Co., Four awards: Boundbrook, N. J.; Latrobe (Pa.) plant; Piney River (Va.) plant; Willow Island Works, St. Marys, W. Va.

American Factors Ltd., Four awards: Pioneer Mill Co. Ltd., Lahaina Maui, Hawaii; Grove Farm Co. Ltd., Puhi Kauai, T. H.; Kekaha Sugar Co. Ltd., Kekaha Kauai, T. H.; Oahu Sugar Co. Ltd., Waipahu, T. H.

American Sugar Refining Co., Baltimore, Md.

Atchison, Topeka & Santa Fe Railway System, Three awards: Dining Car Dept.; Eastern Div.; Kansas City Div.

Bayuk Cigars Inc., Ninth & Columbia Ave.

Buckeye Cellulose Corp., Cellulose & Specialties Div., Memphis, Tenn.

Canadian Gypsum Co. Ltd., Hagersville, Ont., Canada.

Caterpillar Tractor Co., Manufacturing, East Peoria, Ill.

Celanese Corp. of America, Plastic, Newark, N. J.

Champion Paper & Fibre Co., Houston Div., Pasadena, Tex.

Colonial Airlines Inc., General Office, Traffic.

Curtis Companies Inc., Clinton (Iowa) Div.

Cyprus Mines Corp., Cyprus.

Davison Chemical Co., Four awards: Twenty Units & Home Office; Div. of W. R. Grace & Co., Bartow, Fla.; Perry, Iowa; Nashville, Tenn.

Deere & Co., Deere Plant Works, Moline, Ill.

Denver & Rio Grande Western Railroad Co.

City of Detroit, Mich.

E. I. Du Pont De Nemours & Co. Inc., 24 awards: Martinsville Plant; Minquadale (Del.) Lab.; Newport (Del.) Plant; Seaford (Del.) Plant; Engineer Research Lab., Wilmington, Del.; Office Buildings, Wilmington, Del.; Wilmington (Del.) Mech. Development Lab.; Clinton (Iowa) Plant; Doyle Works Products Div., Massachusetts; Chambers Works, Deepwater Point, N. J.; Rubber Lab, Deepwater Point, N. J.; Repauno Plant, Gibbstown, N. J.; Newark (N. J.) Plant; Parlin (N. J.) Plant; Niagara Falls (N. Y.) Plant; Paint, Varnish & Lacquer, Toledo; Paint, Varnish & Lacquer Plant, Pa.; Chattanooga (Tenn.) Plant; Plastic Materials, Old Hickory, Tenn.; Synthetic Fibers, Old Hickory, Tenn.; Houston Plant, El Porte, Tex.; Spruance Plant, Richmond, Va.; Waynesboro Tech. Div., Virginia; Belle (W. Va.) Works.

Eitel McCullough Inc., Main Plant, San Bruno, Calif.

Firestone Tire & Rubber Co., Brentford, England.

Fort Wayne Corrugated Paper Co., Rochester, N. Y.

General Dynamics Corp., San Diego, Calif.

General Electric Co., Three awards: St. Louis (Mo.) Lamp Works; Bellevue (Ohio) Lamp Works; Cleveland (Ohio) Equipment Works.

General Shoe Corp., Three awards: Leather Shoe Manufacturing, Frankfort, Ky.; Cowan, Tenn.; Pulaski, Tenn.

Harbison Walker Refractories Co., East Chicago (Ind.) Works.

Harper Wyman Co., Chicago.

Holly Sugar Corp., Worland, Wyo.

International Business Machine Corp., Plant Two, Poughkeepsie.

C. D. Johnson Laboratory, Georgia Pacific Sawmill, Toledo, Ore.

Jones & Laughlin Steel Corp., Muncy Penn Manufacturing Wire Rope.

Lane Wells Co., Los Angeles Manufacturing, Office & Research.

Lockheed Aircraft Corp., Marietta, Ga.

S-1384. **Two-eyelet Black "Jaguar."**
High welt. Nitro-crepe sole and heel.
Leather-lined steel toe box.
B 8-12 D 6-12
C 7-12 E 6-12

Here is the safety shoe you asked for— Thom McAn's black Jaguar!

PEOPLE who bought our brown Jaguar safety shoe kept asking, "Why don't you make this shoe in black, too?" As customers' requests are taken very seriously at Thom McAn, we did just that.

You're looking at the result. Feast your eyes on the design of this shoe. You'll see why it's so popular with so many men. The sleek, long, low-cut lines are identical to those of Thom McAn's famous *dress* Jaguar. This is a safety shoe that combines real style and comfort with the rugged protection of leather-lined steel toe boxes.

Pass the word along to your men. Here is the safety shoe they *asked* for. The shoe they'll be glad to wear to work . . . and off the job as well.

NOW SOLD THREE WAYS: 1. Directly from Thom McAn warehouses for plant inventory, or on mail-order basis. **2.** Through Thom McAn's special In-Plant Fitting Plan. **3.** At Thom McAn Shoe Stores. Send today for details on Thom McAn's special money-saving plans—plus a full description of the new Thom McAn Safety Shoe line. Write: Thom McAn Safety Division, 25 West 43rd Street, New York 36, N. Y.

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A Division of the Melville Shoe Corporation

Minnesota & Ontario Paper Co., Int. Falls & Insulite Div., Minnesota.

Montgomery Ward & Co., Mail Order House, Baltimore, Md.

National Cash Register Co., Dayton, Ohio.

National Distillers Products Corp., Old Crow Dist., Kentucky.

New Orleans Public Service Inc., New Orleans, La.

Oswego Falls Corp., Fulton (N. Y.) Plant.

Pacific Gas & Electric Co., San Francisco.

Permacel Tape Corp., Industrial Tape Corp., New Brunswick, N. J.

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Pillsbury Mills Inc., Denison, Tex.

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We will ship your trial order for any amount of ŌNOX and footmats. *You pay nothing* unless fully satisfied after 60 days' use.

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HAWTHORNE, CALIF.

Procter & Gamble Co., Two awards: Long Beach, Calif.; Cincinnati, Ohio.

Provincial Paper Ltd., Port Arthur, Ont., Canada.

Radio Corp. of America, Manufacturing Plants in California, Indiana, New Jersey, New York, Ohio & Pennsylvania; Bloomington, Ind.; Indianapolis, Ind.; Cherry Hill, Camden, N. J.; Harrison, N. J.

Remington Arms Co. Inc., Three awards: Bridgeport, Conn.; Lake City Arsenal, Independence, Mo.; Ilion (N. Y.) Works.

Republic Steel Corp., Two awards: Berger Manufacturing Div., Canton, Ohio; Printing & Stationery Dept.

Rohm & Haas Co., Philadelphia, Pa.

Ryan Aeronautical Co., Aircraft Parts, San Diego, Calif.

Southern Wood Preserving Co., Two awards: East Point Plant, Georgia; Macon, Ga.

Standard Oil Co. (Ohio), Petroleum Wholesale & Retail Sales.

Sullivan Consolidated Mines Ltd., Sullivan Abitibi, Canada.

Swift & Co., Two awards: Ft. Worth, Tex.; San Antonio, Tex.

Sylvania Electric Products Inc., Three awards: Burlington (Iowa) Plant; General Office Lighting Div.; Radio Tube Plant, Brookville.

U. C. Corp., Bakelite Co., Bloomfield, N. J.

U. C. C. Corp., Three awards: Linde Air Products Co., Speedway Laboratory, Indiana; Carbide & Carbon Chemical Co., Texas City, Tex.; Union Carbide Nuclear Co., Oak Ridge Nat. Laboratory.

U. S. S. Co., Columbia Steel Co., Geneva Works & Ironton, Salt Lake City.

Weyerhaeuser Timber Co., Three awards: Springfield Plywood Div., Springfield; Saw Mill, Klamath Falls, Ore.; Logging, Enumclaw, Wash.

AWARDS OF MERIT

Allen Industries Inc., Central Office.

Allis Chalmers Manufacturing Co., Indiana Works, La Porte, Ind.

American Agricultural Chemical Co., Phosphate Rock Mines, Florida.

American Can Co., Nine awards: Halethorpe Factory; Pacific 94-A, San Francisco; Factory 97-A, San Jose, Calif.; Factory 110-A, Stockton, Calif.; Factory 41-A, Tampa, Fla.; Factory 36-A, New Orleans, La.; Factory 21-A, Portland, Maine; Factory 34-A, Geneva, N. Y.; Houston, Tex.

American Cyanamid Co., Five awards: N. American Cyanamid Ltd., Welland, Canada; Wallingford (Conn.) Plant; Warners Station (N. Y.) Plant; Bridgeville (Pa.) Plant; New Castle (Pa.) Plant.

American Factors Ltd., Kauai Consolidated Terminals Ltd., Hawaii.

American Radiator & Standard Sanitary Corp., Two awards: San Pablo (Calif.) Works; New Orleans (La.) Works.

American Rock Wool Corp., Wabash (Ind.) Plant.

American Safety Razor, Kingsbury Ordnance Plant, La Porte, Ind.

American Tobacco Co., Two awards: Scranton (Pa.) Branch; Virginia Branch, Richmond, Va.

American Welding & Manufacturing Co., Warren, Ohio.

Atchison, Topeka & Santa Fe Railway System, Six awards: Railways Line Haul; Cleburne Shop; Middle Div.; Slaton Div.; Southern Div.; Western Div.

Atlantic Steel Co., Atlanta, Ga.

Bartgis Bros. Co., Ilchester, Md.

Bird & Son Inc., Asphalt Rooking Plant, Chicago.

C. Brewer & Co., Ltd., Kilaea Sugar Plantation.

Buckeye Cellulose Corp., Charlotte Mill.

Budd Co., Railway Equipment Div., Philadelphia.

Burroughs Adding Machine Co., Schaefer Plant.

Cabot Carbon Co., Two awards: Canal Plant, Franklin, La.; Schafer "A" Plant, Pampa, Tex.

California-Texas Oil Co. Ltd., Refinery at Pernis, Holland.

Canadian Refractories Ltd., Plant Two, Marelan, Que., Canada.

Canadian Salt Co. Ltd., Windsor Works, Windsor, Ont., Canada.

Celanese Corp. of America, Three awards: Textile Rayon, Rock Hill, S. C.; Chemical Textile,

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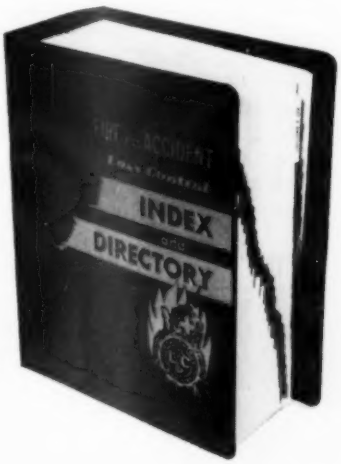

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Texas; Rayon, Bridgewater, Va.

Central Power & Light Co., Corpus Christi, Tex.

Certain Teed Products Corp., E. St. Louis, Ill.

Chain Belt Co., Plant Three.

Chicago & North Western Railway System, Two awards; Dakota Div.; Iowa Div.

Chicago Bridge & Iron Co., Birmingham, Ala.

Chicago, Burlington & Quincy Railroad Co., McCook Nebraska Div.

Chrysler Corp., Automotive Body Div., Exeter Plant Chrysler ABD.

Clayburn Co. Ltd., Vancouver, Canada.

Continental Can Co. Inc., Hummel Ross Div., Hopewell, Va.

Davison Chemical Co., Div. of W. R. Grace & Co., Columbus, Ohio.

Deere & Co., Three awards: Vermillion Malleable Iron Works, Hoopeston, Ill.; Deere Tractor Co., Waterloo, Iowa; Van Brunt Manufacturing Co., Horicon, Wis.

Denver & Rio Grande Western Railroad Co., Two awards: Maintenance of Equipment; Transportation Dept.

Dictaphone Corp., Bridgeport, Conn.

Dow Chemical Co., Two awards: Rocky Flatts Plant, Denver, Colo.; Texas Div., Freeport & Velasco, Tex.

Dravo Corp., Excluding Subsidiaries, Pennsylvania.

E. I. Du Pont De Nemours & Co. Inc., 23 awards: Columbia Plant; San Francisco Plant; Exp. Station, Henry Clay, Del.; New Port (Del.) Weaving Laboratory; Stine Laboratory, Newark, Del.; Hotel Du Pont, Wilmington, Del.; East Chicago (Ind.) Plant; Kinetic Plant, East Chicago, Ind.; Baltimore (Md.) Plant; Flint (Mich.) Plant; Carl Junction (Mo.) Plant; Eastern Laboratory, Gibbstown, N. J.; Yerkes Cellophane Laboratory, Buffalo, N. Y.; Rochester (N.Y.) Plant; Cleveland (Ohio) Plant; Lockland (Ohio) Plant; Printing Plant, Philadelphia; Towanda (Pa.) Plant; Chemical Manufacturing, Memphis Plant Misc.; Sabine River Works, Orange, Tex.; Misc. Manufacturing, Victoria, Tex.; Richmond (Va.) Tech. Div.; Belle Works, Charleston, W. Va.

Firestone Tire & Rubber Co., Six awards: Buenos Aires, Argentina; Sao Paulo, Brazil; Des Moines, Iowa; Plant One, Tire Manufacturing, Akron, Ohio; Pottstown, Pa.; Memphis, Tenn.

Flintkote Co., New Orleans, La.

Foote Mineral Co., Exton Plant.

Forstmann Woolen Co., Passaic, N. J.

General Aniline Film Corp., Linden (N. J.) Plant.

General Cigar Co., Three awards: Division St., Kingston, Pa.; Nanticoke, Pa.; Mt. Carmel, Pa.

General Electric Co., Four awards; Oakland (Calif.) Lamp Works;

—To page 116

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the watchman makes *his* rounds while the hands on his CHICAGO Watchclock make *their* rounds.

In the morning, there is a permanent dial-record of exactly where the watchman was during each **hour**...in the silence of the night.

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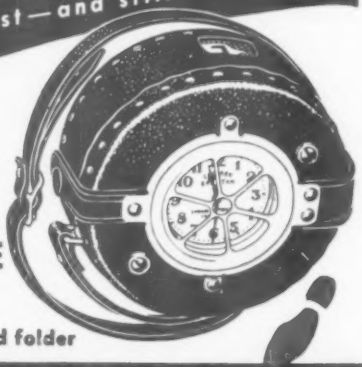

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Foundry Environment Control

Engineering Manual for Control of In-plant Environment in Foundries, published by the American Foundrymen's Society, Incorporated, Des Plaines, Ill., 1956. 145 pages, hard cover, $7.70 to non-members, $6.00 to members of the American Foundrymen's Society.

AN EXTREMELY WELL organized and informative book covering foundry ventilation and foundry hygiene problems. Section 2, "Exhaust Books and Exhaust System Design," contains some excellent information on designing exhaust systems. A step-by-step explanation of the nomograph methods of exhaust system is covered, also a step-by-step procedure for using the widely accepted friction chart for designing exhaust systems is covered.

Section II, "Maintenance and Testing," gives some good hints on maintenance programs and testing procedures for exhaust systems.

The book is well illustrated with more than 200 illustrations, charts, and tables.

L. C. SMITH

BOOKS AND PAMPHLETS

Chemicals

Aluminum Chloride, Anhydrous Manufacturing Chemists' Association, 1625 Eye St., N.W., Washington 6, D. C. 1956, 11 p. Chemical Safety Data Sheet SD-62. 30c.

Arsenic Trioxide. Manufacturing Chemists' Association, 1625 Eye St., N. W., Washington 6, D. C. 1956, 11 p. Chemical Safety Data Sheet SD-60. 30c.

Phthalic Anhydride (Commercial). Manufacturing Chemists' Association, 1625 Eye St., N. W., Washington 6, D. C. 1956, 15 p. Chemical Safety Data Sheet SD-61. 30c.

Toluene. Manufacturing Chemists' Association, 1625 Eye St., N. W., Washington 6, D. C. 1956, 18 p. Chemical Safety Data Sheet SD-63. 30c.

Construction

Transportation and Application of Flammable Road Surfacing Materials. Association of Casualty and Surety Companies, 60 John St., New York 38. 1956, 4 p. Special Hazards Bulletin Z-95, Vol. IX—1956.

Electrical Industry

American Standards in the Electrical Field. American Standards Association, 70 East 45th St., New York 17. 1956, 67 p.

Directories

Fire and Accident Loss Control Index and Directory. Loss Control Associates, Plattsmouth, Neb. 1956, 1323 p. $48.00.

—*To page 58*

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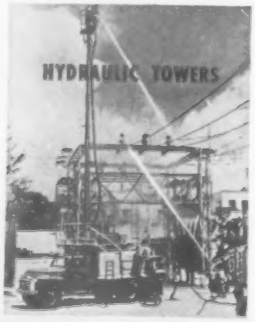

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MAGAZINE ARTICLES

Aeronautics

"Aircraft Structures Must Fail Safe." J. F. McBrearty. *SAE Journal.* June 1956, P. 26-29.

"Grease Gun Injury—A Case Report." Donald N. Vivian and Samuel G. Christian. *Industrial Medicine and Surgery.* June 1956, P. 282-284.

Atomic Power

"Impact of the Atomic Energy Industry on Community Health." *AMA Archives of Industrial Health.* May 1956, P. 425-467. (A Series of papers by various authors.)

Fire Protection

"Conveyors Pass: Fire Can't." *Factory Management and Maintenance.* June 1956, P. 105.

Handling Materials

"Greater Safety Means Better Material Handling." Ernest W. Fair. *The Plant.* June 1956, P. 61-62.

Health

"The Engineering For Consent for an Industrial Medical Program in the U. S." Edward L. Bernays. *Industrial Medicine and Surgery.* June 1956, P. 258-260.

"The Hartford Plan—Small Plant Medical Service." *Industrial Medicine and Surgery.* June 1956, P. 285-288.

"Importance of Biological Research in Industrial Medicine." Paul Gross and C. Richard Walmer. *Journal of the American Medical Association.* June 16, 1956, P. 569-573.

Housekeeping

"Planned Procedure Keeps the Plant Clean." P. R. Russell. *The Graphic Arts Monthly.* June 1956, P. 26-30.

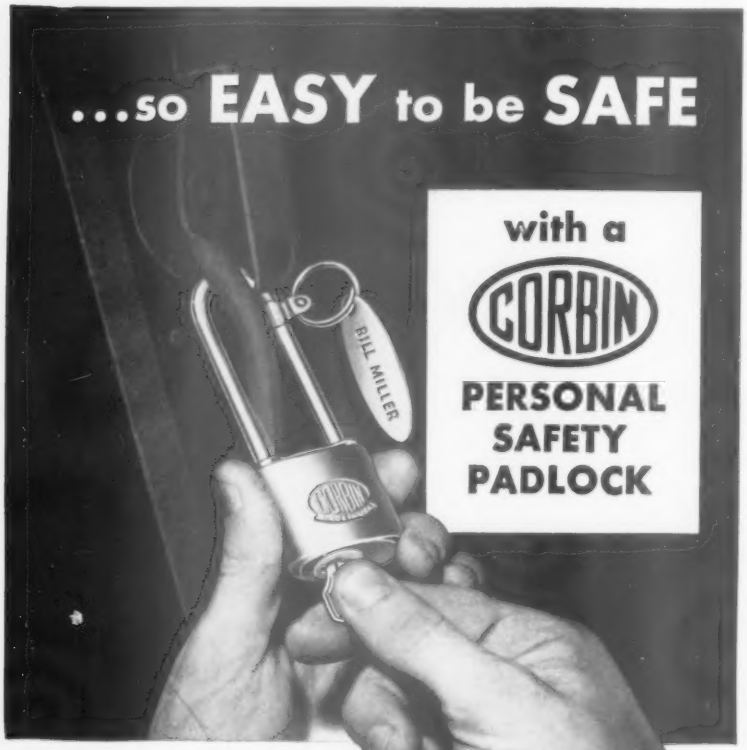
Office Safety

"A Check List for Better Office Safety." Guy Ferguson. *Best's Insurance News—Fire and Casualty.* May 1956, P. 57-58+.

Physical Examinations

"The Early Detection of Disease by Periodic Examinations." S. Charles Franco. *Industrial Medicine and Surgery.* June 1956, P. 251-257.

"The Effectiveness of Periodical Medical Examinations." James P. Baker and others. *Industrial Medicine and Surgery.* June 1956, P. 248-250.



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Better Vision

—From page 25

be kept for replacement and repair of safety glasses.

Purchase of eye safety equipment should not be limited to one company. At least two companies should be used for such purposes, thereby giving you a more diversified supply of materials.

Community goggles, those that are used by more than one person, should be sterilized frequently. Cleaning stations should be placed conveniently throughout the plant; preferably one in each department which employees can use to clean their safety glasses.

Supply of plastic shields should be maintained for issuing to visitors and employees who occasionally enter the shop areas. They also can be used as a temporary protection over a new employee's own glasses, until he receives his regular prescription safety glasses.

A supply of special safety filter glasses should be kept in stock for use on jobs where there may be exposure to harmful rays of ultra-violet or infra-red such as in

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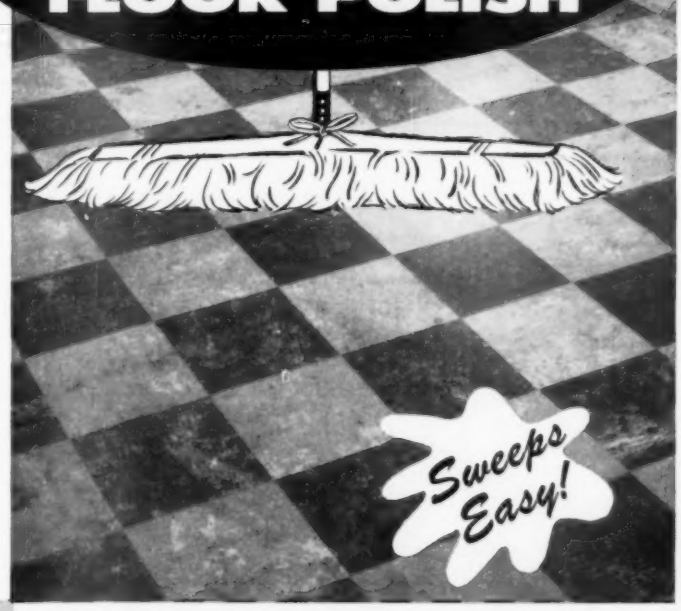

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TOUGHNESS — to withstand heavy traffic.

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Withstands Water Spillage — Will not turn white.

Lustre Buffs Back to like new appearance.

Traffic Lanes Patch in without recoating entire area.

Can Be Removed like water emulsion waxes.

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welding, cutting, furnace tenders, metal pourers and on other jobs where high temperatures and excessive glare exist.

As vision changes with age, a periodic vision re-examining program should be maintained. Employees should have eyes re-examined at least once every two years.

Type of program. Two types of eye safety programs can be put into operation. The out-plant program, where the employee is sent out to the local professional eye man to be fitted for his safety glasses. And the in-plant program, where the employee is supplied with all the necessary services in the plant.

The latter makes for a more efficient program. A program conducted in the plant allows for better knowledge of the employees' visual and protective needs. (Example: Referral of automatic screw machine operator to outside practitioner who is not familiar with visual job standards and type of safety eye equipment necessary.)

Reports to management: Monthly reports to management should present a picture of the work accomplished during the month and any item of interest that occurred during the month such as the number of eyes saved, number of employees who were given attention, and number of safety glasses issued. A graphic analysis on the curtailment of eye injuries should be kept.

Having safety glasses available in your plant does not make for a 100 per cent well functioning program. It is how you put these materials to use that gives results. At the Sperry Gyroscope Company we have put the methods that I have presented into practice and our results show a remarkable eye safety record over the years.

A 100 per cent curtailment of eye losses in industry throughout the country can be accomplished. We at Sperry have proven that. In developing a progressive, well-rounded program to achieve this goal, industry is not only making a tremendous contribution to the nation in stamping out industrial blindness but at the same time is improving its financial well being.

Diary

—From page 27

notebook, and then I turned back to Dander and talked about other things—about the safety training ("We leave that to foremen"); about die guarding ("That's a production problem which we leave to the engineering men"); about safety committees ("We don't use them"); and so on and so on and so on.

In the end the picture emerged of a safety program beautifully organized on a completely clerical basis. Records, displays, reports, investigations, inspections—all done to routine, done neatly and promptly. And without the

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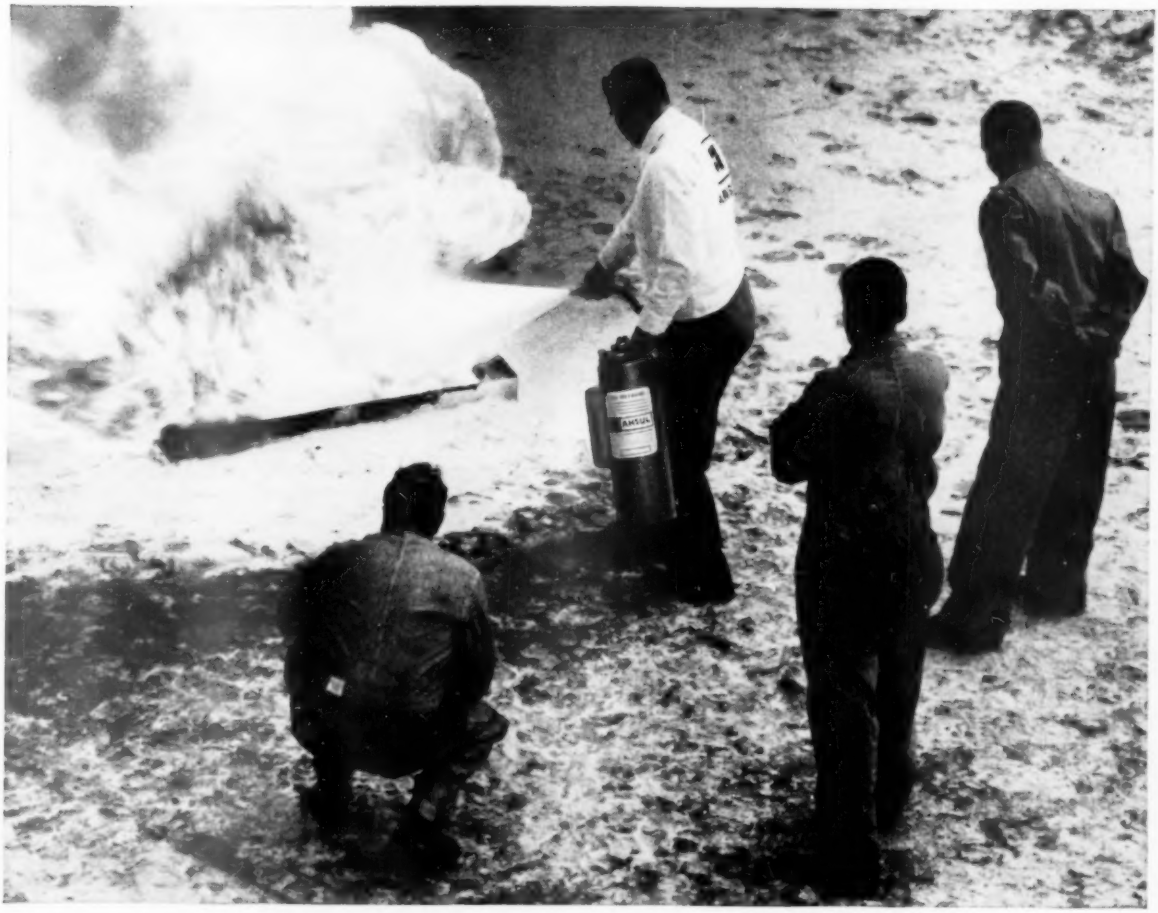

Let this "Visiting Fireman" train your men to fight fire . . . it could save your business

You have a *potential* fire-fighting team right in your plant. These would-be fire fighters *could save your business if fire struck unexpectedly*. All they need is training, the kind that will enable them to respond instantly and properly to any kind of fire emergency.

Ansul can provide this training for a group of your men just as it has for hundreds of its customers. And there will be no charge. It is just one of the "essential" services that Ansul provides for its customers.

Twenty years experience in the fire protection industry has proved to Ansul many times over that all the fire equipment in the world will not save your business *unless* trained hands are available to man that equipment. So, it is important to Ansul that you get *training* along with the fire equipment you buy. Only then will you experience the security that goes with having a complete fire protection program. Only then will you get what you really pay for, what you really need—*complete fire protection*.

You owe it to the life of your business to learn more about Ansul's in-plant fire training service. Get in touch with your local ANSUL MAN through the yellow pages of your phone directory, he will be happy to call on you and explain all of Ansul's customer services in detail. Or write to THE ANSUL CHEMICAL COMPANY, Dept. NS-8, Marinette, Wisconsin.

ANSUL

slightest glimmer of insight into their meaning.

At the end of the second day I knew that I only had one problem to solve. It was not why severity was high. It was why, in the face of a dead safety program, frequency was low. And I had a pretty good idea in advance what the answer to that was.

I called the vice-president of Eastern Enterprises to whom I report. "I've got a stinker for you," I said. He said very promptly, "I know. That's why you were sent there. Compensation costs are way out of line. What's wrong?"

I replied, "I don't know the details yet. But if you want me to spend another week alternating between an audit of the safety records and some evenings of drinking in the neighborhood taverns, I'll find out. Either there is plain faking of records or the company is bringing in to work at piddling jobs men who should be laying off because of injuries. Do you care very much which it is?"

"No," he said. "Not very much. But some. You go on to your next call. I'll send a man down to work it out. Send the data in and we'll follow through."

"What about the plant superintendent?" I asked. "Do I report frankly to him?"

"Don't bother. We'll handle him. But the faking of records aside, what basically is wrong? Why is the faking necessary?"

"It's a clerk's program," I said. "Not just because the safety director was a clerk before he became a safety man. I've known some who were and became useful. But this man has remained a clerk. He has no technical sense and no sense of human relations."

The vice-president was silent for a moment, then sighed audibly. "Right," he said. And the bite of the word sounded like the crunch of a pair of pliers snapping off a wire—the wire that was a man's career.

I'm writing these lines on the train on my way to the next assignment—and I find myself, for once, untroubled by the knowledge that I've broken a man. If he was only ignorant, or only incompetent, if he was just a drunk or a guy with an unhappy home life, I'd feel guilty, feel that what I should have done was work with him, help him, bolster him—maybe even cover up for him.

I could forgive him for being a bureaucrat, a snob, and a detail-piddler. But not for being a liar!

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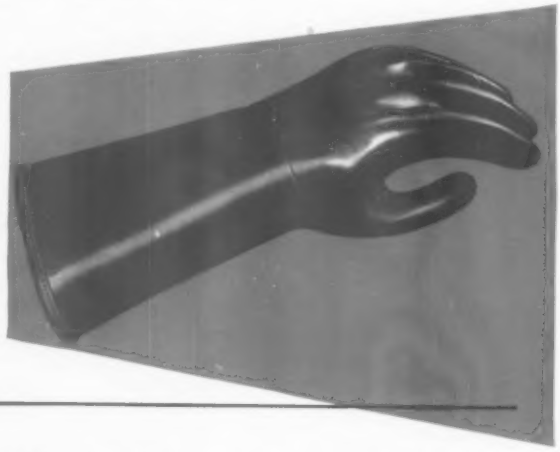

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in the safety field

Sept. 13-14, York Harbor, Me.
Twenty-ninth Annual Maine State Safety Conference (Marshall House). Arthur F. Minchin, secretary, Department of Labor and Industry, State House, Augusta, Me.

Sept. 17-19, Cleveland, Ohio.
Eighteenth Annual Ohio State Safety Conference and Exhibit (Hotel Carter). H. G. Hayes, secretary-treasurer, Suite 514, 2073 East Ninth St., Cleveland 15, Ohio.

Oct. 22-26, Chicago
Forty-fourth National Safety Congress and Exposition (Conrad Hilton Hotel). R. L. Forney, secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11.

Nov. 8-9, Columbia, S.C.
Nineteenth Annual Accident-Prevention Conference (Hotel Jefferson). J. D. Watson, Jr., safety engineer, South Carolina Industrial Commission, P. O. Box 539, Columbia, S.C.

Dec. 10-11, New Orleans
Louisiana Safety Association Conference (Roosevelt Hotel). Charles E. Doerler, secretary, Louisiana Safety Association, P.O. Box 1148, Shreveport, La.

Mar. 19-20, Fort Wayne, Ind.
Northeastern Indiana Safety Conference and Exposition. Ivan A. Martin, manager, safety council, Chamber of Commerce, Fort Wayne.

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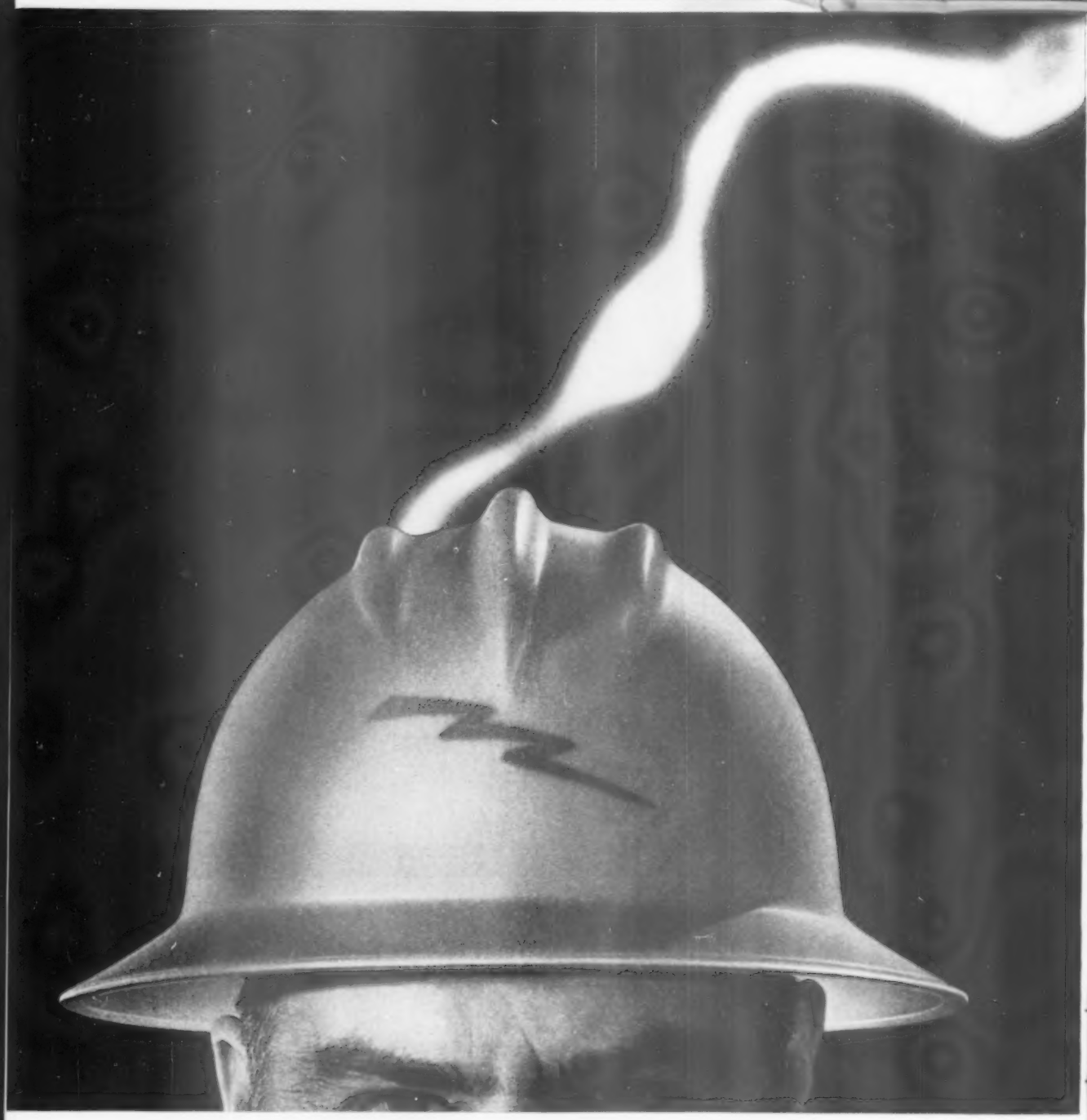

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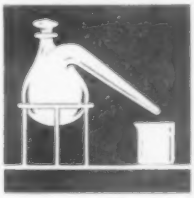

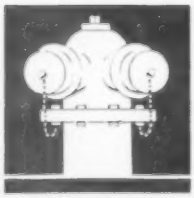

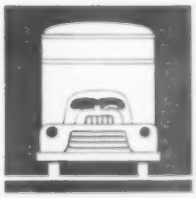

AUGUST, 1956

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WE WANT to call attention to the addition, on our masthead, of the name of Thad Hackett, prominent free lance artist responsible for the high quality of design which has characterized our fledgling Journal since its birth. We hope Mr. Hackett's talented art direction will be a permanent part of the Journal's continuing growth... Last issue on our inside back cover we printed the Safety Engineers' Creed in a design suitable for framing. Response was so favorable that this issue we are presenting, in a like manner on that page, the Canons of Ethics for Engineers. Perhaps you will find these two fine codes of conduct appropriate for display in your office... Also in this issue... Nobel prize-winning geneticist Hermann J. Muller has written a thought-provoking article on "After Effects of Nuclear Radiation," which asks for reexamination of the exposure limits now considered "safe" for workers in industries using radioactive material... The University of California's J. H. Mathewson and Robert Brenner take a new look at quality control applied to accident statistics.

Professor J. H. Mathewson is assistant director of UCLA's Institute of Transportation and Traffic Engineering and author of many papers on safety research.

Analysis of ACCIDENT STATISTICS

by J. H. Mathewson and Robert Brenner

Robert Brenner is associate engineer-statistician, UCLA, where he is teaching, doing research and working on a Ph.D. in industrial safety and engineering statistics.

INTRODUCTION: The importance of a statistical approach in the control of accidents has been reported by several authors including Goode (1), Howell and Johnson (2), MacFarland (3), Mathewson, Brenner and Hulbert (4), Nordan, Orlansky and Jacobs (5), and Lee (6)*. The techniques reported by all of the above writers essentially are adaptations of the Shewhart Quality Control Chart techniques which were originally designed to assist in controlling the quality of manufactured product (7).

In this paper, the authors have as their first objective the presentations of some of the statistical theory underlying the various techniques. The second objective is to extend the techniques to situations where there are wide variations both in severity and amount of exposure.

Accident Control Chart Techniques

Quality control charts are graphical techniques which portray the actual quality of the manufactured product relative to the range within which the quality is expected to fluctuate due solely to random causes. Concomitant with the event of quality falling outside the range is the judgment that some non-random, hence assignable, factor caused this event to transpire. A complete discussion of use of these charts is given by Grant (8) and Burr (9).

Control charts as applied to safety work facilitate the judgment that an accident rate (or any other convenient index of accident likelihood) has deviated so far from its normally expected value that it is highly probable that some new, non-random causality has come into operation. Although the control charts for analyzing accident statistics are logically identical to charts used for analyzing quality of manufactured product, the writers believe that these charts should not be referred to as "quality control charts." It is accordingly recommended that quality control charts when employed in the accident context be known as "accident control charts." This expression will be used in this paper.

For purposes of this paper, the authors have organized the control chart technique into five basic elements which will first be discussed in context of quality applications, and then in the safety context. These elements are:

1. Selecting the quality index.
2. Estimating the range of variation of the index.
3. Initial setting up of charts.
4. Judging as to assignable causation.
5. Revising charts to reflect changing conditions.

Index of Quality: Any of a number of different indexes may be taken to represent the quality of production but careful judgment has to be exercised as to the most appropriate index for a given situation. One is the number of defective items produced during a given period of production time; another is the number of defective items produced in a given production lot. Control charts using the former as the index of quality are referred to as "C" charts, while those using the latter are referred to as "$\bar{C}$" charts.

Various measures of accident likelihood (the analog in accident control charts of the index of manufactured quality in quality control charts) have been reported. Goode (1) treats number of accidents occurring in some period of time; MacFarland's example utilizes the number of first aid cases per thousand man hours worked (3), Mathewson et al (4) consider the number of motor vehicle accidents per 100,000 miles of driving; Lee (6) uses the number of major and minor injuries per 100,000 man hours worked. All of these indexes can be classified into one of two categories—first, the raw number of accidents occurring in some period of time and second, the number of accidents† occurring per unit of exposure.

A complete discussion of the probability models underlying the use of each of these measures as the index of accident likelihood in accident control charts is given in an earlier work by the authors (4). In this paper it will suffice to say that the control charts are based upon the generally accepted belief that the random variables Y_t (raw number of accidents occurring during time t) and R_t (the frequency rate during period t) have the Poisson distribution with standard deviations $\sqrt{Y_t}$ and $\sqrt{R_t}$ respectively (10) (11) (12) (13) (14). This is expressed in the following probability statements:

"Y" CHART—RAW NUMBER OF ACCIDENTS

$$\Pr\{ Y' - A\sqrt{Y'} < Y_t < (Y' + A\sqrt{Y'}) \} = f(A) \quad [1]$$

"R" CHART—ACCIDENT RATE

$$\Pr\left\{ \left(R' - A\sqrt{\frac{R'}{E_t}}\right) < R_t < \left(R' + A\sqrt{\frac{R'}{E_t}}\right) \right\} = f(A) \quad [2]$$

where:

Y_t = number of disabling injuries occurring in month t

E_t = exposure in month t expressed in units of 1,000,000 man hours

R_t = actual frequency rate in month t = $\frac{Y_t}{E_t}$

Y' = some standard number of accidents in a month to which Y_t would be compared

R' = some standard frequency rate to which R_t would be compared.

**Numbers in parentheses, ( ), identify references that are cited at the end of the paper; numbers in square brackets, [ ], refer to equations cited in the text.*

†The term "accident" is used here to describe a discrete event which can be either injury producing or non-injury producing. Hence all indexes utilizing severity of injury are eliminated.

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Statement [1] tells us that the range in which the raw number of disabling injuries in any month should fall is centered around the standard Y′ and extends to A standard deviations (of Y′) in both directions from Y′. The standard is the number of accidents occurring in a month under "normal" conditions. In some proportion f(A) of successive months, the number of accidents would be expected to fall in the range defined by A standard deviations in each direction from the standard. Similarly, [2] defines the range in which the rate should fall as A standard deviations (of R′) around R′. Criteria for deciding how large A should be will be discussed shortly. At this time let us first consider criteria for determining whether the "Y" chart (raw number of accidents) or the "R" chart (accident rate) should be used, and second, what should be defined as the comparison standards Y′ and R′ in [1] and [2] respectively.

The decision as to whether a "Y" or "R" chart should be used depends directly upon whether or not exposure is changing. As long as exposure is not changing, analyses utilizing either index are logically equivalent. But where exposure is changing the rate index must be used. Expression [2] demonstrates that the range of variation for a rate is an inverse function of the square root of the amount of exposure over which the rate was computed. Thus, as exposure increases, the range of variation around the standard decreases. This explains the well known fact that accident rates of large companies do not fluctuate as much from month to month as do rates of smaller companies.

The comparison standards (Y′ and R′) may be defined in any of a number of ways but, in the main, they fall into two general categories. First, they can be defined as some function of a company's own previous accident record. Examples would be a company's (or department's) accident record of the previous month, of the same month of the previous year or of the average of the preceding six month experience, etc. Second, the standard can be some general average deduced from industry wide averages, National Safety Council figures or Bureau of Labor Statistics data. Both types of standards have their individual advantages. Where there are widely differing hazards among departments of a company, it is meaningful to compare a department against itself, but not against other departments. On the other hand, by comparing a rate with a national average it is possible to effect company-to-company comparisons. Therefore, a complete accident control chart program can effectively utilize both types. The sole requirement is that the index of accident likelihood for a given period and its comparison standard be expressed in the same units.

Range of Variation: When some monthly (or other time period) value of the index falls outside its control limits, the decision is made that it would be worthwhile to look for an assignable cause for the unusual deviation. If the value falls within the limits, the decision is that it is not worthwhile to look for an assignable cause. Either decision may be right or wrong, depending upon whether or not an assignable cause in fact exists. Inherent in these decisions are two types of possible error that are shown schematically in Figure I. The first (Type I) is the decision to look for an assignable cause when there is none in actuality. The second (Type II) is the decision *not* to look for an assignable cause when in fact an assignable cause *is* present. The range of variation is selected so as to strike a balance between the consequences of these possible errors and of their relative probabilities. If the Type II error is more serious than the Type I error, a narrower range is indicated. If the Type I error is more serious, the range should be wider.

The control limits are set up in [1] and [2] at "A" standard deviation from the comparison standard. For example, when A=3 the implication is that 99.7 per cent of values of Y_t drawn from a population of mean Y′ will fall in the range of $(Y' \pm 3\sqrt{Y'})$, and 0.3 per cent will fall outside. When a value of Y_t falls outside of this range, two conclusions are possible. The first is that the accident likelihood as measured by Y_t is the same as that measured by Y′ and that a rare event (three chances out of 1000) has occurred. The second, refusing to concede that the rare event has occurred, asserts that the accident likelihood is not that measured by Y′ but in fact is either greater or less depending upon whether Y_t was beyond $(Y' + 3\sqrt{Y'})$ or $(Y' - 3\sqrt{Y'})$ respectively. Out of 1000 such decisions, three will be wrong: that is, accident likelihood will not have changed in three out of the 1000 instances, but will be erroneously stated as having changed. This is the so-called alpha or Type I error described above.

On the other hand, if a value Y_t falls within the range $(Y' \pm 3\sqrt{Y'})$ the conclusion would be that the accident likelihood is the same as that measured by Y′. This conclusion would be wrong if, in fact, the accident likelihood were different. The probability of an erroneous conclusion of this type (Type II error) is determined by Y_t and Y′.

As the decision range centered on the standard is increased, the probability of making the Type I error (concluding that accident likelihood changed when it did not change) is decreased. At the same time, the chance of failing to detect a change is increased. Decreasing the range will increase the chance of concluding that there was a change when in fact there was none. The decision as to size of range must be conditioned, therefore, by a prior judgment as to which error is more costly, failure to sound an alarm when an alarm should be sounded or sounding an alarm when no alarm should have been sounded. Wide ranges will rarely permit a false alarm but at the same time will frequently fail to sound a needed alarm. Narrower ranges frequently will permit a false alarm but rarely will fail to sound a needed alarm.

In setting up the original quality control charts, Shewhart's objectives, in part, were to set the limits (i.e., range of variation) so as to strike an economic balance between the probability of failing to detect an assignable cause for variation and the probability of looking for an assignable cause when one does not exist. In accident control charts, on the other hand, it is difficult to evaluate which error is more costly to industry. Repeated false alarms will soon condition operating personnel to receiving frequent reprimands so that when a real change in accident likelihood occurs, the necessary reprimand will have limited effect. Or if a safety director frequently reports to management that the accident rate is unusually

high, management will soon (consciously or sub-consciously) begin to ignore the reports. On the other hand, failure to detect early that accident likelihood has increased will result in delaying remedial measures and thus will allow more accidents, and losses, to occur.

Opinions vary as to what the allowable range of variation should be in accident control charts. MacFarland (3) utilizes 3 sigma limits in the rate chart. Goode (1) utilizes a range of approximately ± 2 sigma on a chart developed around raw numbers of accidents. Howell and Johnson (2) utilize 2 sigma limits in a rate-type chart. Norden (5) uses 2.576 sigma and makes certain statistical corrections*. It seems some compromise is indicated between 2 and 3 sigma limits.

The authors believe that two sets of limits can effectively be used in accident control charts, one set serving as warning limits and the other set as action limits. An accident rate falling beyond the warning limits but not beyond the action limits would be construed as evidence, although suspect, that there was a change in accident likelihood. A rate falling beyond the action limits would be interpreted as evidence of a change that no longer is merely suspect. There would be little chance of there not being a warning notice when in fact there was a change in accident likelihood. A complete discussion of warning and action ranges is given by Grant (8). One graphical scheme for utilization is shown in Figure 2.

Setting Up Charts: One of the immediate problems in setting up a control chart is to arrive at some value for the comparison standard. This presents no problem in quality control applications where the machine is set to produce at some predetermined quality level. Similarly, there is no problem in accident control charts where the standard is some known average such as a National Safety Council three year average. A problem does arise however, where the standard is some function of a company's own past experience. This problem relates to the number of points that should be used in the initial computation of limits in setting up a chart. Grant points out that, on statistical grounds, at least 25 points should be used, but that smaller numbers (8 to 10) may be used if lengthy time intervals must elapse before 25 points can be accumulated. Since it would be impractical to wait 25 months before setting up a system, a smaller number should be used. MacFarland uses for his example a 13 point base period that was developed on a weekly basis. The authors believe this 13 point base to be adequate since procedures for revising the limits, when applied, will correct any erroneous initial judgment.

The procedure essentially involves computing a set of "trial" action limits from the data in some base period. The data in the base period are then compared to these trial limits. If an index for a given month in the base period falls outside the trial limit, a new set of limits is computed excluding that index. This procedure will be demonstrated in an example later.

Figure 1
Possible Decisions and Errors in Interpreting Accident Control Charts

LOCATION OF POINT	DECISION	ACTUAL OPERATING CONDITIONS	
		An Assignable Cause of Variation Is Present	There Is No Assignable Cause of Variation
Point is above upper control limit.	Look for assignable cause.	Decision is correct.	Decision is wrong. Type I Error
Point is between upper and lower limits.	Do not look for assignable cause.	Decision is wrong. Type II Error	Decision is correct.
Point is below lower control limit.	Look for assignable cause.	Decision is correct.	Decision is wrong. Type I Error

Judgment of Assignable Causation: The control chart technique, specifically the limit settings, have as their ultimate purpose the facilitation of the judgment as to the probable presence or absence of an assignable cause for deviation from the expected value. Guiding principles are readily stated for interpreting quality from the value the index takes on during any period in relation to the control limits. But the control limits are themselves probabilistic criteria so that any guiding principles for judgment cannot supplant the judgment itself; that is to say, the guiding principles must be treated as guides and not as ironclad rules. In practice there are no hard and fast rules for deciding that action is indicated; consequently, each case must be carefully studied. The following criteria related to mathematical theory of extreme runs may be used as guides in interpreting control charts.

1. Action is indicated when there occurs a run of four or more points up (or down) that culminates in a point beyond the action limit, i.e., when each succeeding value is greater (or smaller) than the previous one and the last point in the run exceeds the action limit (MacFarland).
2. Where 2 and 3 sigma limits are used, action is indicated when the following number of points fall beyond the same (upper or lower) 2 sigma limit (Grant):
   a. Two successive points.
   b. Two out of three successive points.
   c. Three out of seven successive points.
   d. Four out of ten successive points.

**The limits utilized by Norden, Orlansky and Jacobs (5) are (changing their nomenclature to agree with that of this paper)* $R' \pm 2.576 \sqrt{\frac{R'}{E} + \frac{0.829}{E} \pm \frac{1}{2E}}$ *The third and fourth terms of this expression are corrections for continuity and the assumption of normality. The authors in this paper have chosen to omit these corrections in the interest of simplicity. The effect is to narrow the confidence interval and hence yield a less conservative judgment. However, the decrement in the sensitivity of the decision function is not considered to outweigh the gain in simplicity of computation.*

Figure 2
Schematic Representation of Accident Control Chart
Using Action and Warning Limits

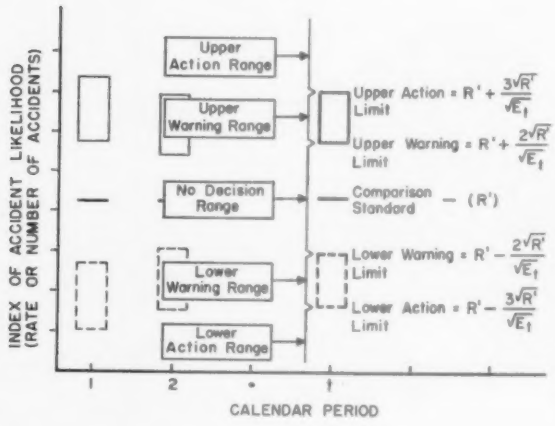

INDEX OF ACCIDENT LIKELIHOOD
(RATE OR NUMBER OF ACCIDENTS)
Upper Action Range
Upper Warning Range
No Decision Range
Lower Warning Range
Lower Action Range
Upper Action Limit = R' + 3√R'/√E_t
Upper Warning Limit = R' + 2√R'/√E_t
Comparison Standard — (R')
Lower Warning Limit = R' − 2√R'/√E_t
Lower Action Limit = R' − 3√R'/√E_t
1
2
CALENDAR PERIOD

Figure 3
Accident Data for a Hypothetical Group of Companies

Month	Number of Disabling Injuries	Exposure Man-Hours x 100,000	Rate Dis. Inj./ 100,000 Hrs.
January, '53	27	25.4	1.06
February	48	26.6	1.80
March	80	32.7	2.45
April	58	35.7	1.62
May	64	37.4	1.71
June	72	38.7	1.86
July	54	37.7	1.43
August	43	40.5	1.06
September	60	39.7	1.51
October	73	43.1	1.70
November	69	43.7	1.58
December	85	42.5	2.00
January, '54	47	40.7	1.16
February	91	44.1	2.06
March	99	41.4	2.39
April	108	44.8	2.41
May	89	41.7	2.14
June	65	39.8	1.63
July	81	42.3	1.91
August	80	43.7	1.83
September	81	42.7	1.90
October	82	44.3	1.85
November	68	41.2	1.65
December	110	39.3	2.80

Revision of Control Charts: Another consideration in the use of control charts deals with changing the expected value to which the production quality is to be compared once the judgment is made that an assignable cause is probably present. If after a judgment is made the cause is isolated and corrected, there is no need to revise the control chart. On the other hand, if it is not isolated and corrected, succeeding judgments as to presence of additional assignable causes, over and above the already accepted presence of the one assignable cause, require a modification of the control chart to reflect the already established cause. Again, this problem (revision of control charts) is particularly important in accident application since, more often than not, it is very difficult first, to identify a new accident casualty and second, to know that it has been corrected.

As in the case of judging that action is indicated, there are no universally accepted criteria for revision of limits and each case must be given careful study. The nature of the accident statistic is such that particularly careful judgment should be made before limits are revised upward because this permits higher "no action" rates. Conversely, revision of limits downward might serve as an added stimulus and hence should be more readily performed. The following revision criteria listed by Grant can be considered:

1. Whenever 7 successive points on the control chart are on the same side of the standard.
2. Whenever in 11 successive points on the control chart, at least 10 are on the same side.

Example Demonstrates Technique

To demonstrate all the phases of the accident control chart technique the following example will be used. A control chart is to be set up to compare the monthly performance of a group of companies to the preceding industry average. The accident experience and exposure of the hypothetical companies is given in Figure 3.

Trial Limits: The basic period extends from January, 1953, through January, 1954, during which time there were 780 disabling injuries and a total exposure of 48,451,000 man hours.* The average rate $\bar{R}$ is:

$$\bar{R} = \frac{780}{485} = 1.61 \text{ Dis. Inj./100,000 man hours}$$

The action limits are computed for each month of the base period utilizing the same computed value of $\bar{R}$ for every period and the separate exposures for each period:

Month	Exposure Man Hours × 100,000	Action Limits
Jan. '53	25.4	$1.61 \pm 3\frac{\sqrt{1.61}}{\sqrt{25.4}} = 2.37 \text{ \& } 0.85$
Feb. '53	26.6	$1.61 \pm 3\frac{\sqrt{1.61}}{\sqrt{26.6}} = 2.35 \text{ \& } 0.87$
Mar. '53	32.7	$1.61 \pm 3\frac{\sqrt{1.61}}{\sqrt{32.7}} = 2.27 \text{ \& } 0.94$

Since the actual rate of 2.45 for March, 1953, exceeds the upper trial action limit (2.27) for March, the trial limit procedure is repeated excluding the March data. The total number of disabling injuries in the base period is, then, 700 and the exposure is 45,181,000 man hours. The new trial average becomes:

$$R = \frac{700}{452} = 1.55 \text{ Dis.Inj. } 100{,}000 \text{ man hours}$$

The action limits for each month are then computed with this new standard and, if all rates fall within their respective limits of this standard, the control chart is set up with this modified average as standard (Fig. 4).

Action Indication: The first indication that the rate might be unusually high is in February, 1954, when the rate of 2.06 fell in the warning range. The rates in March, April and May were clear indications that accident likelihood was unusually high in comparison with the average computed for the trial base period.

Revision of Limits: Revision of limits is suggested in August since the August rate was the seventh successive rate above the expected rate. The new limits are calculated by considering as the base period the preceding 13 months—August, 1953, through August, 1954—trial limits being computed in the same manner as previously outlined.

$$R = \frac{990}{548} = 1.81$$

Month	Exposure Man Hours × 100,000	Action Limits
Aug. '53	40.5	$1.81 \pm 3\sqrt{\frac{1.81}{40.5}} = 2.44 \text{ \& } 1.18$
Sept. '53	39.7	$1.81 \pm 3\sqrt{\frac{1.81}{39.7}} = 2.45 \text{ \& } 1.17$
Oct. '53	43.1	$1.81 \pm 3\sqrt{\frac{1.81}{43.7}} = 2.42 \text{ \& } 1.20$

It can be verified that the rates for August, 1953; January, 1954, and April, 1954, fall outside their action limits. The procedure therefore is repeated excluding the data for these months. We then have:

$$R = \frac{792}{422} = 1.87$$

This value will be found to be satisfactory and, being plotted on the chart, is treated as the comparison standard for succeeding months.

**It should be noted that wherever amount of exposure is changing from one period to the next in a group of periods, the average rate for this group is computed by dividing the total number of accidents by the total exposure. It would not be strictly correct to average the individual period rates since this procedure would not weight the rates for their respective exposures.*

Figure 4
Accident Data Analysis for a Hypothetical Group of Companies

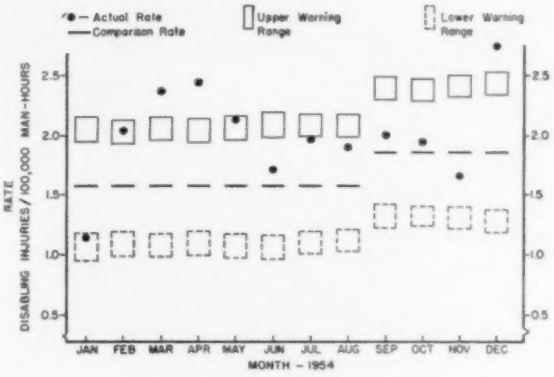


Figure 5
Computation of Ranges of Chance Fluctuation for Two Hypothetical Companies

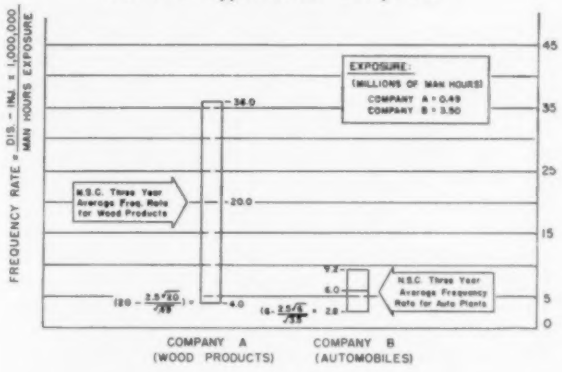
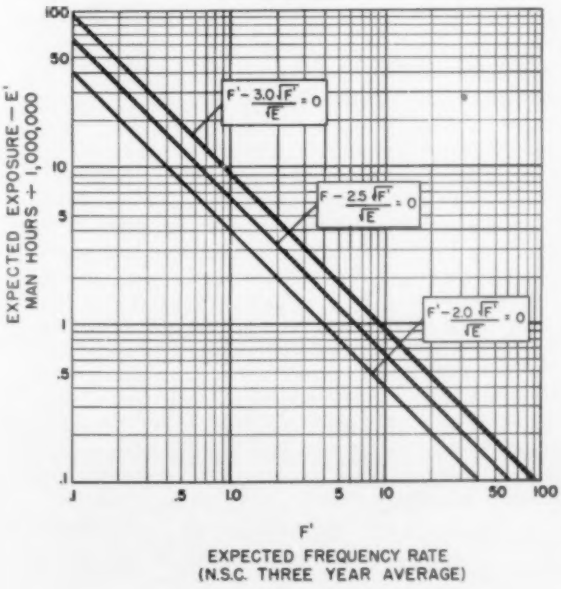


Figure 6
Critical Exposures as a Function of Expected Frequency Rate



Effect of Exposure and Interpretation

The behavior of accident rates with changing exposure has long been known by safety directors: the rates of small companies tend to fluctuate more widely than those of larger companies; smaller companies achieve zero frequency rates as well as extremely high frequency rates more frequently. This can be seen analytically from expression [2] in which the range of variation is inversely related to the square root of the amount of exposure. This is shown in Figure 5 where the accident control charts for two companies of widely differing exposure are plotted utilizing 2.5 sigma limits. The two companies will vary around their own appropriate standards but the range of variation of the large company B will be much smaller than that of the smaller A.

An interesting situation arises when the lower control limit (either warning or action) falls below zero; that is, is negative. Clearly a negative frequency is impossible. The only possible interpretation is that there was insufficient exposure to allow for meaningful interpretation of a zero frequency rate. The simplest way to get around this difficulty is to increase the length of the period under consideration to the point where there would be sufficient exposure to allow for meaningful interpretation of a zero rate. Thus, a two month index might be meaningfully analyzed while a one month index might be of little use.

To facilitate interpretation of zero frequency rates, the authors have prepared a chart, Figure 6, on which are plotted the minimum exposures required for interpreting zero frequency rates as a joint function of the standard and the exposure of the accident control chart techniques presented in this paper. The chart is entered from the bottom at the frequency rate appropriate for the company's type of operation, and from the left at the estimated exposure. If the intersection falls below the line, the company does not have sufficient exposure to allow for anything but a chance interpretation of a zero rate. Either the 2.0, 2.5 or 3.0 sigma line can be used depending on the decision function chosen.

Conclusions

The safety engineering profession is constantly confronted by the problem of having to decide whether or not there has been some change in accident likelihood. The usual statistical basis for this decision, until recent years, has been the accident rate. However, the profession should accept as fact that the accident rate is a statistic that will fluctuate even without any change in the underlying accident likelihood. Thus, it is clear that any meaningful interpretation of a rate must be made in relation to this fluctuation. Accident control charts represent an analytical tool for making such meaningful interpretations of accident rates. Therefore, if properly used, these charts can provide valuable guidance to the direction of the accident prevention effort.

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The authors wish to express their appreciation to several persons who have assisted in the development of these concepts. The paper is a direct result of a highly active teaching and research program in industrial safety at the University of California that was initiated and has since been under the general direction of Dean L. M. K. Boelter, chairman of the Department of Engineering on the Los Angeles campus. Dean Boelter reviewed and commented on an earlier version of this paper. Professor George W. Brown, also of the University of California, has offered valuable suggestions on the statistical methodology. Colonel W. L. Tubbs (USAF, Ret.), the assistant for Ground Safety, Headquarters USAF, Washington, D. C., supplied Air Force accident data which was examined during the course of developing the ideas. J. H. McKenzie, manager of the Safety Department, General Petroleum Corporation, has examined the procedures and offered suggestions based upon his own experience. J. M. Kaplan, secretary of the Greater Los Angeles Chapter, National Safety Council, supplied data for testing the procedures. J. W. Stennett, manager of the Accident and Fire Prevention Department, National Association of Mutual Casualty Companies, reviewed an earlier version of the paper and offered valuable suggestions to simplify the presentation.

Many U. S. industries and organizations help our Latin neighbors develop safety programs. Our government also plays a major role in . . .

Safety Engineering Education in South America

by Morris B. Wallach

Learning by doing is applied to traffic safety for students at Chilean grammar school.

SURVEYS conducted in South America, including one by Dr. Milton Eisenhower, have disclosed the fact that no other part of the world is developing so rapidly as this area. Frequent requests for information and assistance expressed by South Americans have demonstrated their desire for greater production and higher living standards, not only in the future, but now.

Such requests have been received by the American Embassies, the International Cooperation Administration and other U.S. government agencies. Assistance of this type falls into the category of U.S. technical assistance to underdeveloped countries. The development of country-wide safety programs has become an important contribution within the scope of teaching our technical "know how," in the fields of productivity improvement and good labor-management relations, to foreign governmental, industrial and labor agencies. Safety education and training contribute an important part of a seven step planned program procedure which includes:

1. *Survey of Extent of Need for a Program.* At the request of the foreign government involved, a safety consultant is sent to the country for a short period to make an initial survey of need. The consultant decides at which level the program should start, based on the industrial development and general progress of labor and management productivity and the prevention of work accidents.
2. *Development of Disabling Injury Statistics.* Existing industrial accident and injury statistics are reviewed in order to determine their deficiencies, to recommend standards for the computation of disabling injury statistics and to develop a procedure for the analysis of such statistics to reveal the cost of accidents and injuries to labor and industry.
3. *Safety Engineering Education and Training Courses.* This includes two types of education, (a) in the U.S. Department of Labor, universities, etc., where trainees are sent from foreign countries to learn the theoretical and practical application of safety principles to production processes, and (b) the development of safety engineering courses within the foreign countries and universities, departments of labor, national insurance organizations, industrial associations and trade unions by U.S. safety consultants who are assigned to the particular foreign country for periods extending to two years or more. Such training is not only for the engineer, the supervisor and the worker, but also for the professor of the university, for the teacher in the primary schools and for instructors who in turn teach engineers, foremen, workmen and labor leaders.
4. *Program Development in Plants.* Upon request by an industrial plant or organization, a survey is made to determine the extent of need and the type of program to be developed. Then a detailed analysis of processes and operations is conducted in three or four separate visits of one full day each. At this time individual operations are studied to determine the

Morris B. Wallach, safety engineer with the Bureau of Labor Standards, for two years was industrial safety consultant in Chile for the U. S. Department of Labor. He is a member of the American Society of Safety Engineers.

efficiency of work procedures and to eliminate existing hazards from the operation. Recommendations are developed as a result of these studies. Further contacts are made with management and the union, at which time a safety organization is planned with labor-management participation. A report is then drawn up and submitted for consideration by management and the union. When agreement is reached the program is put into effect under the guidance of the U.S. consultant and the trained safety engineer or technician who is working with the consultant in the development of the program. The safety engineer or technician then follows up the program at regular intervals to determine its progress and to improve its efficiency.

5. *Labor-Management Cooperation.* With all these activities, labor and management are constantly working together in the plants in the operation of the safety program. Close coordination between the two groups is essential for the proper development and continued progress of the program.
6. *Development of a National Safety Council.* The logical outgrowth of a successful national program is a determination to organize a national safety council. The U.S. consultant encourages, advises and assists industry, labor, the public, educational organizations and safety engineers and technicians with the development and organization of a national safety council whose purpose is the advancement of safety in the fields of industry, education, traffic and the home, and to assist in the development of standards and laws in their respective fields.
7. *Development of Annual Safety Congresses.* In order to acquaint the general public with the activities of the national safety council, of the safety engineers and technicians and of professors teaching safety in the universities, a Safety Congress is planned and developed under the guidance of the national safety council of the country. An additional purpose for the Congress is to teach the general public some of the basic principles of accident prevention and how they can cooperate to assist with the general program.

Safety posters on display were developed by primary school children in Chile.

President of Chile (center) watches author (left) demonstrate training model for manual lifting procedure at First Safety Congress, Santiago, Chile, in October, 1953.

Two countries in Latin America have completed the above seven step program—Chile and Uruguay. Other countries such as Mexico, El Salvador and Brazil have training courses in industrial safety but have not completed the planned program to date.

Since the writer took part in the development and conduct of university courses and training courses in Chile, this country can serve as an example of what has been done, is being done and what can be done in the field of safety engineering education in South America.

In March, 1953, an Industrial Safety Engineering Training Course was set up and was sponsored by the U.S. Operation Mission to Chile in cooperation with the University of Chile. The course continued for one year, embraced the basic principles of industrial safety engineering as they applied to Chilean industry and contained progressively more advanced and specialized work, including teaching procedures and the development of training courses.

The 36 students registered for this course were practicing engineers, safety technicians and Department of Labor safety inspectors. Out of this first group we developed a staff of 10 safety engineering professors who are presently teaching in the Chilean universities. Some

Location	Students	No. of Students	Duration of Course
1) Catholic University, Santiago	Fifth year—industrial, civil, chemical, mechanical and electrical engineering students and commercial engineering students.	92 (3 groups)	Permanent required course for engineering students during their fifth year—2 hrs. per week.
2) Chilean Technical University, Santiago	Third year—industrial, mechanical and electrical engineering students.	43	Permanent required course for engineering students during their third year—1 hour per week.
3) Military Engineering Academy, Santiago	Military engineering students (officers).	15	Permanent required course for military engineering students—2 hours per week.
4) Caja de Accidentes del Trabajo	Engineers and technicians from industrial plants.	55 (2 groups)	9 months (150 hrs. of study).
5) Caja de Accidentes del Trabajo	Supervisors from industrial plants.	87 (4 groups)	2 months (30 hrs. of study).
6) Caja de Accidentes del Trabajo	Industrial labor union officials.	33	2 months (30 hrs. of study).
7) Union Headquarters, Industrial Copper Workers	Union members.	128 (4 groups)	2 months (30 hrs. of study).
8) Industrial School of Nuñoa	Machine Shop apprentices (part of apprenticeship training program in Chile; safety will be taught as a part of all future apprenticeship training courses).	30	3 weeks (6 hrs. of study).
9) Chilean Army Training Center	Sergeants—(group 1). Officers—(group 2). Automotive farm equipment (tractors, reapers, etc.).	36 8	Agricultural Safety Training Course, 2 months (30 hrs. of study).

are university staff professors and 15 are instructors in industrial safety fundamentals.

The instructors began to teach 30-hour courses for supervisors, workmen and union officials. Some of the courses were conducted within industrial plants in conjunction with the development of complete safety programs. Others were conducted in the Caja de Accidentes del Trabajo, a semi-fiscal insurance agency resembling somewhat our State Insurance Funds. These courses for supervisors and workmen were conducted after working hours and on a voluntary basis. The Department of Labor in Chile sponsored courses which were conducted by safety inspectors who were in the original group of students attending the year course.

One of the instructors was assigned the job of teaching 30-hour safety training courses for union officials and members in the labor union headquarters.

Training courses completed during 1954 are shown in the table above.

The writer left Chile in February, 1955, at the completion of a two-year program. Since then the country-wide program has continued to expand. Other Chilean universities—such as the University of Concepción, the Santa Maria Technical University of Valparaiso—have started industrial safety engineering courses. Plant training courses increased as new plant safety programs were developed and 30-hour safety courses were conducted at other union headquarters, the Caja de Accidentes del Trabajo and the Department of Labor in Chile. The entire seven step planned program is continuing successfully in Chile.

A similar program has been in effect in Uruguay since 1953. The U.S. safety technician left there at the completion of a two year program. Although the safety educational program was not introduced in universities as successfully as in Chile, still the program has continued in 1955 and has expanded under the guidance of the Department of Labor and Industry of Uruguay and the Banco de Seguros del Estado.

In addition to educational safety programs in the universities, associations, industries and labor unions, the primary schools have also introduced safety into their scholastic curriculum, not only in the field of traffic safety, but also home and school safety as well.

The Green Cross symbol of safety is growing in importance in the eyes of the South American people in the universities, schools, industry, on the streets and in the homes. Safety is making progress in South America.

AFTER EFFECTS OF NUCLEAR RADIATION

by Dr. Hermann J. Muller*

IN BOTH THE military and the peaceful utilization of nuclear energy the feature most damaging to human life, health and well-being is the escaping high energy radiation.

It was otherwise in the bombing of Hiroshima and Nagasaki. There many more people were killed by the collapse of buildings, by physical shock, fire and heat rays than by the high energy radiation. It must be admitted that the radiation deaths caused by these two bombings are in a sense still occurring, however, and that they will continue for several decades, if we classify in this way the excess of deaths per year among persons of any given age who had been exposed to the bombing, as compared with an equal number of persons of the same age who had not been exposed. But even if we add the great number of years of life lost in this way to those lost by the radiation deaths of the first few weeks, the total toll of deaths caused by radiation turns out to be smaller than the number killed by the blast effects. The same would hold in general for A-bombs used in a tactical way in warfare in the future, if these bombs are not purposely rigged, as with cobalt, or set off near the earth's surface so as to increase the fallout.

1. Amount of Radiation Damage To Be Expected

On the other hand, an H-bomb of the type set off in 1954 and 1955, although having an explosive force inordinately greater than that of an A-bomb, is capable through its fallout of destroying life by radiation damage over an area more than a hundred times as great as that devastated by the blast effects. This is because in such a bomb the hydrogen fusion, initiated by a primary fission reaction of active uranium or plutonium, is used, secondarily, to provoke further fission. This occurs in a casing of ordinary uranium, a substance not easily induced to undergo fission. It is the radioactive fission products from this added uranium that give the fallout by far the major part of its lethal potential. Because of the cheapness of the needed additives we may assume that in any future all-out-war—and what war can be guaranteed not to become all-out?—great numbers of these superbombs will be available as strategic weapons. Since each such bomb can ravage thousands of square miles with its radioactive precipitation (8-12, 27), it is obvious that it can be highly effective even when it is far from accurately placed. *(Numbers in parentheses indicate references listed at end of article.)*

It is also obvious that, to enable these bombs to do the maximum damage to large populous regions, the attempt will be made to space them in such a way as to have their wide marginal areas of fallout overlapping one another. This is the procedure called "pattern bombing." In this way even the marginal areas are brought above the radiation level for lethality, and so the range of effective fallout for a given number of bombs is much greater than if they were either widely separated or superposed. At the same time, most of the survivors of such pattern bombing are caught in a position so interior within the group of conjoined fallout areas that they must endure a much longer period of hiding out in basements and underground shelters until their evacuation can be undertaken without their being subjected to too much radiation en route. For their trip to a relatively safe area will take such a long time that the level of radiation must fall to a much lower level than if their journey were a short and easy one. Eventual evacuation would of course be imperative for all these people, because for years it would be dangerous to live in such regions.

It would be surprising if the surviving population of a country that had been systematically subjected to pattern bombing did not accumulate in the course of time an average of a hundred to several hundred roentgen units* of radiation, even though they had been well disciplined for such an attack and well provided with underground shelters, radiation counters, facilities for decontamination, battery-powered radios and other essential supplies. At least, it has been estimated that people remaining all the time in the basements of suburban-type houses, well sealed off from the dust of the outer air, in positions 110 miles downwind from an explosion of the type set off in the Pacific in March two years ago, would receive some 100 roentgens of gamma radiation

**This article constitutes a revised edition of an address entitled "The Effects of Radiation on the Human Constitution," delivered before the Military-Industrial Conference, Chicago, Feb. 9, 1956. The first version was published in the* Saturday Review *on June 9, 1956.*

**A roentgen unit (written as "r") of X or gamma radiation is the amount that will, when applied to air under standard conditions, produce ions carrying 1 electrostatic unit of charge per cubic centimeter. The actual number of pairs of ions giving this result is about 2.1 X 10^9 per cc. In water or tissue, however, the number of pairs of ions produced by 1 r is about 800 times this. A chest X-ray commonly delivers about a tenth of a roentgen (.1 r) to the interior of the chest. The body as a whole, including the reproductive organs, usually receives some 4 to 5 r of radiation from natural sources in the course of a reproductive generation (30 years). Some 400 r to 500 r, if delivered in a short time (e.g., an hour or less), would kill about half of the persons exposed to it.*

from outside during the first week alone (9). Moreover, exposure outdoors in that region on the eighth day, if rain or artificial decontamination had not occurred, might deliver 30 roentgens more of whole body radiation to them in 24 hours. This would not be enough to give many of them serious radiation sickness if they did not get the dust on their skins or into their bodies.

If, however, the population was less well prepared and instructed than here assumed the survivors might in the course of the first week or two receive an average dose of well over a thousand roentgens. This is a dose several times that which would have killed them if it had been received all at once, and when received in this somewhat more diffuse form it would still be enough to give most of them pronounced radiation sickness. We shall not attempt to estimate here what proportion of the people in the entire fallout area would be less protected or at a shorter distance than this from the explosion and in consequence would have had such severe radiation sickness as to kill them. This proportion would depend very much upon how well the people had been disciplined in advance, provided with underground shelters and otherwise equipped.

2. *Earlier Effects of Radiation*

There are still many gaps in our knowledge of the ways in which radiation produces the series of maladies known as radiation sickness, that afflict people within the first days and weeks after a heavy exposure (21, 24, 25). However, more and more evidence is accumulating that the chief basis of the disturbance lies in pointwise injury to the genetic material of individual cells, striking now here, now there, in a random fashion among cells that normally are replenishing themselves by cell division. Among the cells most actively engaged in such replenishment, and therefore very sensitive to killing by radiation, are those of the blood system, such as bone marrow and lymph gland cells. From these are derived the red and white blood cells and the little platelets necessary for insuring blood clotting. Intestinal lining cells must also replenish themselves actively by division and therefore are similarly sensitive. To a lesser extent the same is true of skin and hair cells. Therefore these tissues are among the most affected by radiation and the symptoms that follow are largely secondary effects of the destruction, or the prevention of normal division, of large numbers of cells of these kinds.

For example, if enough intestinal lining cells are destroyed or prevented from being replenished, gaps arise in the lining through which vitally needed fluid leaks out into the intestine, while destructive intestinal juices seep into the body spaces (26). At the same time, the diminution in number of white blood cells reduces the body's defenses against germs and the reduction of clotting power leads to hemorrhages through the perforations that may have been induced in blood vessel linings. The cells of the reproductive organs also are rapidly dividing cells; hence the reproductive organs are likely to enter a period of sterility.

Part of the effect, in all these cases, must be a consequence of the temporary checking of cell multiplication that radiation is known to cause. But much of it is a consequence of the breaking of the chromosomes within the cells. The chromosomes are the minute threads that contain the cell's hereditary equipment—its thousands of different, highly specialized genes. It is only when cells divide, and therewith transmit their precious cargo of genes to their two daughter cells, that a break in a chromosome, previously produced in it by radiation, may result in a cell that lacks one or more of the resulting chromosome fragments. Such a cell and all cells later descended from it are likely to be abnormal and impaired in functioning and may die off. A break may also be followed by a sticking together, at their raw ends, of chromosome pieces that do not belong together, and these combination fragments may become lodged between the two daughter cells that are forming, in such a way as to prevent their proper separation from one another in that as well as in any following cell divisions. The result in such a case also is the eventual death of all cells descended from the one in which the chromosome breakage occurred. Thus, much of radiation sickness is an expression of the damage inflicted on the hereditary (genetic) material of numerous cells lying scattered throughout those tissues in which there is normally an active process of renewal by cell division.

On this interpretation it is not surprising that, if the irradiation has not been too drastic, there will be enough normal cells remaining so that, by the multiplication of these, the depleted tissues can become restored to a considerable degree. The restoration is often incomplete, however, and diverse parts of the body are thereby left in a somewhat weakened condition, in which the necessary operations are carried on less effectively. Since the more rapidly multiplying the cells in the given tissue were, the greater the damage, it is evident that the younger the individual is when irradiated, the more he will be

Professor Hermann J. Muller was awarded the Nobel prize in 1946 for his work in genetics, including formulation of the now-recognized principles of spontaneous gene mutation and the conception of the gene as constituting the basis of life and evolution (1918-1926), and 20 years of research based on his discovery of the production of gene mutations and chromosome changes by X-rays. He holds a Ph.D. and an honorary D.Sc. from Columbia and a D.Sc. from Edinburgh, Scotland. Since 1945 he has been at Indiana University, working chiefly on radiation-induced mutations.

affected. This will express itself, among other things, in a checking of growth from which he will never fully recover. Moreover, those parts of him that were in a faster growing, more formative state at the time of exposure will be especially retarded and deranged. That is why even doses of 25 to 100 roentgens, if delivered to the young fetus, can give rise to permanent abnormalities. Among these is the condition of small head or microcephaly, resulting in defective intelligence, that was found in some of the children born at Hiroshima several months after the bombing.

3. Delayed Effects

One of the kinds of damage to body cells that is sometimes brought about by radiation is the conversion of a normal cell, probably by some kind of mutation in a gene, into a cell with the potentiality of later producing a malignant growth, either of blood cells, as in leukemia, or of some other type. These symptoms sometimes become evident only when conditions are appropriate for such growth to occur—often not until decades after the irradiation. Fortunately, the malignancies are induced in only a small minority of people by such doses as can be tolerated by the whole body. However, in cases in which only a small part of the body has been irradiated, a dose may have been received that is far higher than the whole body could have tolerated. Here the chance of a malignancy later developing is much greater.

More frequent among the late effects of irradiation of the whole body are the development of minute spots of opacity in the lenses of the eyes. These cataracts, seldom large enough to impair vision seriously, show where individual cells had been permanently damaged, very likely by breaks in their chromosomes. It is only because the lens is a transparent tissue that we can directly detect these points of injury in it. However, it may be inferred that the same kind of thing happens in all parts in which there are cells that can divide. This would explain what is by far the most serious of the long-term effects of radiation on the exposed person himself—the shortening of his span of life.

It is remarkable how few people, even among physicians, are yet aware of this insidious effect on life span and of the exact rules it follows. These rules, in preliminary form, were discovered some 10 or more years ago by Dr. R. D. Boche, then at the University of Rochester but shortly afterwards at the University of Chicago and now in California. He discovered these rules on going over data obtained by a number of investigators during the war, under the Manhattan District project, on the time of death of irradiated mammals of several different species (2, 3). The principles were further developed by G. A. Sacher, A. M. Brues (4), E. Lorenz, and others. The results have been so consistent that there is no reasonable doubt of the application of the same rules to man, especially in view of some confirmatory evidence from man. They lead to the conclusion that, for each roentgen unit of radiation received by the whole body at a given age, if delivered at a rate of not more than a few roentgens per day, there is on the average a loss of something like five days of life, perhaps as much as two weeks, depending somewhat upon the age. There is still uncertainty about the exact quantity and about its manner of dependence upon age, but not about the general principle. No one particular ailment is thereby induced in the exposed group of mice, rats, dogs or people: they are just made a trifle more susceptible to all causes of death, much as if they had been aged by a given amount.

Since the effect is simply proportional to the amount of radiation, so long as the rate of radiation per day is low, a dose of 200 roentgens, received in a dispersed manner over a considerable period, would cause a pseudo-aging of something like 1000 days. That is, death would on the average occur nearly three years earlier than if there had been no exposure. This proportionality of the effect to dose at low rates of delivery of the radiation is understandable if it has its basis in chromosome changes, for at low dose rates these chromosome effects also follow this rule, unlike most biological effects. If, however, the rate of delivery of the radiation is raised considerably, so that the 200 roentgens here in question are received in a period of hours, the frequency of permanent chromosome changes becomes disproportionately greater, and corresponding with this there will be a more extreme curtailment of the life span.

In view of all this, it is rather surprising to read that a given amount of radiation is entirely harmless, or such a statement as the final sentence in a feature article entitled "Fallout True Story" (23), which appeared in the November, 1955, issue of the Office of Naval Research's magazine, "Research Reviews." Referring to the 64 natives of the Island of Rongelap (Marshall Islands) who had received an estimated 175 roentgens of gamma radiation and additional radiation of a beta type, and who had shown some of the symptoms of radiation sickness, this article concludes: "Yet, after 18 months, all 64 of these natives are still alive, *and none suffer any lasting aftereffects as the result of their experience with radioactive dust.*" (Italics mine.) Do we not officially admit the long known shortening of life, and the fact that any exposure, no matter how small, exerts some permanent damage?

As for larger doses, it can be calculated that people of, say, 30 years of age who, having been in a bombed region, have somehow managed to survive 1000 roentgens (the first third of the dose received in the first day or two and the rest by the accumulation of decreasing amounts over a period of weeks or months), will probably succumb within something like a decade. Few of these deaths (except for some leukemias and other malignancies) will be individually traceable to the radiation, however. They will appear to have followed from "natural causes." Only a statistical comparison with the frequency of deaths among non-bombed populations will prove the falsity of this interpretation. A similar situation exists in Hiroshima today, but the increase in the death rate is much less extreme than in our hypothetical example because of the relatively small amount of fallout that that bombing produced.

4. Effects on the Descendants

It is fortunate that such large doses as 1000 r, if received gradually, usually cause sterility. For the sum

total of hereditary damage done to later generations by a given amount of irradiation of persons who later reproduce, if expressed in terms of years of life lost, is very much greater than the damage done to the directly exposed individuals. In fact it is probably more than 10 times as great. This total damage to the descendants is spread out over so many generations, however, that even in the most affected generation, the immediate children, it would be very difficult to demonstrate the damage after a dose of about a hundred roentgens. Yet the damage is nonetheless very real and hits humanity at its innermost and most precious core (13-20).

This damage to later generations, unlike that causing the trouble in the tissues of the exposed individual's own body, does not have its basis mainly in gross fragmentation of the chromosomes. The view most widely accepted by geneticists is that such damage consists mainly of permanent chemical alterations, called *mutations*, that are produced by the radiation in a haphazard way in one or another of the genes, the hereditary particles lying within the chromosomes of the reproductive cells. Each chromosome may in fact be regarded as a chain of hundreds of genes, arranged single file. Each of the thousands of different genes in a reproductive cell will have its specialized role to play in the development and maintenance of the offspring which that cell, after fertilization, will produce, and will govern specific reactions in the intricate system of operations whereby that offspring will live and in its own turn reproduce. Thus any alteration of a single gene's composition, brought about by some minute collision that was induced blindly by a bolt of radiation, will in the vast majority of cases cause some disturbance or impairment in the development or functioning of the body derived from an affected germ cell.

It is an old wives' tale, repeated in science fiction, that mutations commonly take the form of monstrosities or freaks. It should be recognized that the impairment will usually be slight, or even unrecognizable, consisting of such traits as a slightly greater than average tendency to rheumatism, or to gastric ulcer or high blood pressure, often not evident until the later years of life, or a higher requirement for some vitamin or a slightly lowered I.Q. One reason for this lack of marked effects is that an offspring containing a mutant gene will almost always inherit from its other parent an undamaged gene of the original kind in question. This normal gene will usually exert a much stronger effect than the mutant gene, being, as we say, "dominant." Yet for all that the mutant gene, and the slight impairment caused by it, will tend to be inherited by a succession of generations. It will tend to hamper these descendants to some small degree at least, even in the presence of the normal gene, until in the end some heir to this legacy finds himself in circumstances where just that disability happens to become the deciding factor in causing his death before maturity or his failure to reproduce. Thus the mutant gene will at long last be eliminated from the population, but only at the cost of the dying out or biological frustration of some descendant, usually a remote one, and the hampering, in some degree, of legatees belonging to the intermediate generations.

In its impact on the population as a whole this kind of effect on later generations is in some ways curiously analogous to the shortening of life produced in the directly exposed generation. For the impairments appear natural and are lost in the crowd of otherwise existing dysfunctions. Yet they may take a very considerable toll. In any given case we can never be sure that the infirmity or the death was caused by the radiation.

It is better established for the mutations inherited by the offspring than for the shortening of the life span of the exposed individuals themselves, that the abundance of the effects is directly proportional to the dose received, no matter how large or small that dose. Thus there is no dose so small that it fails to entail its proportionate risk of causing a mutation. In the case of the mutations of genes, however, unlike the life span effects, the rate at which the radiation is received makes no difference. A given total dose is just as effective in producing these mutations if its delivery was dispersed over a period of 30 years as if it was concentrated into two seconds. Thus the total number of mutations produced by radiation in one generation depends on the total dose of radiation accumulated between the conceptions that gave rise to that generation and the conceptions that give rise to the following generation.

How many mutations are produced in man by a given dose is a matter of considerable uncertainty. However, in the light of data from other animals, the most probable value is that each roentgen unit received by one parent results in one induced mutation among about 400 of his germ cells. This means, for example, that if a parent had received 100 roentgens any child of his conceived after that time would have one chance in four of receiving an induced mutation from him. That is, there would be one such mutation among every four of his children, in addition of course to the several or many mutations of natural origin that they would also be inheriting, mostly from the remote past, and that had not yet been eliminated. If both parents had received 200 roentgens, thus having a total of 400, each child, on the average, would inherit one induced mutation.

It is readily seen that even though each person of the next generation contained, on the average, one mutation induced by the radiation, this would still be far from enough to threaten seriously the continuance of the population as a whole. For we all have a fair number of mutations already and are able to stand them. Therefore mankind would not be wiped out by this means, although of course it could be wiped out in a much more direct way by nuclear warfare if the leaders of mankind became insane enough. Nevertheless, short of such an ultimate catastrophe, any such tampering with our biological birthright as nuclear war would bring is not to be viewed with equanimity. This is especially the case in view of the fact that the conditions of living which in the past led to the elimination of those lines of descent that were more heavily burdened with impairments are no longer exerting a strong enough influence of this kind to prevent the population from deteriorating in some important respects. Thus, whatever genetic damage may be done by radiation today or tomorrow would tend to persist for many more centuries than it would have formerly, and some of it would probably increase. For these reasons, even though the genetic damage entailed

by nuclear warfare would by no means be insupportable, provided this warfare were not repeated in future generations, yet our descendants would suffer to no small degree, and would place the blame on our shoulders, if we did not take all possible steps to avoid this source of biological contamination.

5. *Measures for Defending Our Genetic Heritage*

There are some indications, especially from Dr. Hollaender's group at Oak Ridge, that methods of therapy or prophylaxis may eventually be developed which, if applied shortly before or even immediately after exposure, will drastically reduce radiation damage, perhaps by as much as 50 per cent (5-7). In bacteria this can be done even in the case of the mutation-producing effect. There is little indication, however, that harmless, practicable methods of this kind can be made available for man on a broad scale in the near future, especially for radiation occurring at an unpredictable time or over an extended period, nor do we yet know whether these methods would work against the production of mutations in man. But even if they worked fairly well they might, by saving for life and reproduction large numbers of persons who otherwise would have died from overexposure, open the way for the transmission to later generations of as many induced mutations that otherwise would have met extinction, as the number of mutations that they prevented from occurring. Thus, in addition to such measures, we should also prepare to use other, simpler but less thoroughgoing ones.

In this connection it should again be emphasized that the effect on later generations is produced only by the exposure of people who will later reproduce. One of the measures, then, if war seems imminent, is to evacuate to the country as many children and young people as possible, and also pregnant women and mothers with infants. This is a procedure similar to that which was successfully carried out on a large scale in England during World War II in order to avoid the blast effects of chemical bombs. In this case they must be evacuated to regions hundreds of miles downwind, with respect especially to winds of the upper air, from major cities and strategic points. This very cumbersome procedure, however, even if executed satisfactorily, will not save the genes of the young men, or of many of the young women.

The other major measure for defending our genetic heritage is to take into account in our plans for civil defense and rehabilitation following bombings the very particular need to protect from exposure the reproductive cells of our youth. Let people under 35, and all who are likely later to reproduce, be the last to be accepted for use after a bombing has occurred, in such essential services as rescue work, decontamination, bringing in supplies, transportation and everything else that requires activities that are carried on in relatively unsheltered situations. In this way the older generation may be better assured that, whatever else has happened, their descendants will not be subjected to a lasting biological incubus imposed by negligence of which they, the forebears, had been guilty.

6. *Remote Fallout Damage*

This discussion so far has been confined to the effects on the human hereditary constitution exerted in the region of an actual nuclear attack, or at least in the region of the "local" fallout from such an attack. Much of the fallout from hydrogen bombs, travelling high in the stratosphere, would be dispersed throughout the world and be precipitated for years. However, it can be calculated that even if the equivalent of seven hundred 15-megaton bombs, each of the type and order of strength of that at Bikini on March 1, 1954, were released, the fallout in remote regions would raise the amount of radiation received by the population in the world at large, outside of the local fallout areas, by only one to a few times the amount they ordinarily receive from natural causes (9, 10, 27). This damage, *if not repeated* by similar warfare in later generations, could not seriously impair the genetic composition of the population as a whole, even though it would be harmful to many widely scattered, untraceable *individuals*.

Much more radiation would, however, be received if large amounts of cobalt or certain other substances had been purposely added to the bombs or had been in range of the fire-ball, or if materials, such as fish, derived from the areas of heavy fallout were used as food. Moreover, it is by no means established as yet that certain long-lived radioactive isotopes, such as those of strontium and cesium (9-12, 20), would not accumulate in particular tissues, such as bones, to a degree which would give rise to grave disorders, including cancers, in the population of the directly exposed generation.

7. *Protection in the Peacetime Use of Nuclear Energy*

When we turn from these military effects to the peacetime utilization of nuclear energy, we find a curious situation. At Oak Ridge and presumably at some of the other government-sponsored atomic installations, the officially recognized "permissible dose" of .3 roentgen per week is set (1, 22). In actuality, however, relatively few workers receive more than a fifth of this amount. In the course of five years, a good average of the time the employes usually stay at such a plant, a more exposed worker might thereby receive about fifteen roentgens. This would not result in children who were conceived by him during or after that time receiving an alarming number of mutations caused by the radiation. Moreover, it would result in an average shortening of the worker's own life span by only a few months.

Since, however, it is expensive to provide remote control mechanisms, waste disposal and shielding for protecting the worker to such an extent as at Oak Ridge, we can hardly expect industrial plants now planning their installations and procedures to keep down the dose much below that designated as permissible. This consideration would be even stronger in the case of government-sponsored plants of some countries under greater economic stress than our own. Moreover, it is to be expected that as conditions of employment in such plants become stabilized the workers will remain longer and that, since many of them are highly trained, the plants will attempt to keep them. Consider now what an exposure of "only" the official .3 roentgen per week will

amount to in the 40 years from age 20 to 60. It will come to 600 roentgens—more than that of most exposed survivors in a nuclear war—and in the first 10 years, perhaps prior to the worker's reproduction, it will be 150 roentgens. This amount before reproduction, on the part of just one member of each married couple, presumably the father, will probably cause at least one in every 2 or 3 children, on the average, to receive one mutation induced by the radiation. This is a frequency several times as high as the new mutations that would appear among these children from all natural causes. The induced mutation would thereupon tend to go on down to hamper a long line of descendants until at last it extinguished that line.

Because mutations are usually unspectacular and unidentifiable it is not likely that this visiting of the parents' transgressions on mostly remote descendants would, human nature and its present attitudes being what they are, cause a great deal of compunction on the part of the progenitors themselves. Not so, however, when they come to consider the effect of the 600 roentgens accumulated throughout life on their own well-being. For the effect amounts to a shortening of life that may be estimated at something between 4 and 8 years. That is, the worker's life is shortened by something like one or two years for every 10 years that he works at such a plant. Since this secret is at last creeping out of the technical publications it will not be long before the worker knows this. If industry would lower its so-called "permissible dose" by 9/10, to an average of .03 roentgens per week or 1.5 roentgens per year—an expensive but perfectly feasible undertaking—all but a small part of this damage would be avoided and, more important in the long run, future generations would be spared even more damage than the present one.

The cost of the arrangements necessary for this very high degree of protection has been estimated at some $100 per man per year, or $4000 for each man for 40 years (Manov, *Proceedings of the International Conference on Peaceful Uses of Atomic Energy*, Geneva, 1955). However, even if this hastily made and sketchy estimate of cost turns out to be several times too low, as it well may, the expense would not be as great as paying damages for the loss of 4 to 8 years of each worker's life, or for the higher wages they would demand in place of damages. Moreover, such arrangements if once attempted always undergo considerable reduction in cost in the course of experience and invention.

A plan which would ultimately be amply satisfactory and much less expensive is not to impose weekly ceilings of radiation at all, but to keep track of the exposure being accumulated by each worker and to see to it that he does not receive more than a given total amount of radiation over a given number of *years*. Thus, in the recent report of the Genetics Committee, set up by the National Academy of Sciences, in its study of the biological effects of atomic radiation (21), it is recommended that a worker in an atomic installation not be allowed to receive a total of more than 50 roentgens up to age 30 (by which time a man has usually conceived more than half of his children), nor more than another 50 roentgens up to age 40. It is also recommended that, wherever possible, older workers and those not likely to reproduce thereafter, be used for jobs subject to exposures higher than the ordinary ones.

It would be shortsighted and pernicious to wait for several decades until the untimely deaths of workers could be demonstrated statistically. The designing and setting up of atomic equipment and procedures which is now taking place should be guided by the most advanced knowledge we *now* have. Otherwise we shall be confronted with the far more expensive process of reconstructing our installations and economies later.

Concluding Comments

Only by frankly facing and adequately coping with the hazards of radiation can we satisfactorily maintain and enhance the morale of our workers and win their wholehearted support for a vast program of nuclear development. Growth of the utilization of nuclear energy on an enormous scale and along salutary lines is a vital necessity not only for the building up of our country's defensive strength; it is also necessary if we are to enter upon that unparalleled period of industrial expansion which will show the way for the bringing of well being to all the world. These are the tactics which will tend to ease those stresses of poverty, jealousy, ignorance and tyranny that among the unhappy and credulous millions of many lands less fortunate than ours are providing the preconditions for war.

We may justly be proud that it was our own country which at Geneva last summer took the lead in opening up this realistic course of action, a course which may finally lead civilization out of the critical situation now threatening its existence. But we must see to it that this good beginning is vigorously and wisely followed up. For it will not be many years before the power to commit disastrous acts of nuclear aggression has become distributed among many relatively undeveloped or small countries, the governments of some of which may be insufficiently responsible. The possibility may arise of a much less stable balance than that between two major powers. It will then be a cardinal necessity for people everywhere to come to understand that their conditions of life may be radically improved through the peaceful application of nuclear energy and that, on the other hand, its destructive application constitutes an invitation to universal catastrophe. The appreciation of this two-fold truth can be attained, however, only if the peaceful development is being conducted soundly. This means that its operations must be carried on with such rigorous safeguards that those working on the projects will feel no fear for themselves or their descendants and, in the absence of any such apprehensions, will take pride in the realization that they are among the foremost contributors to human betterment.

At the same time, the population in general must be sufficiently protected from genetic damage by the enforcement of a low enough ceiling of radiation from all artificial sources combined. This means effective supervision over medical as well as over industrial and military uses of radiation and over the disposal of atomic wastes. In setting this ceiling, it must be borne in mind that only one roentgen, delivered to each of a hundred million people, will do a hundred times as much damage to posterity, via the production of mutations, as a hundred roentgens, delivered to each of ten thousand people. Moreover, this genetic damage accumulates from generation to generation if the exposures are repeated in suc-

ceeding generations as the peacetime exposures are expected to be.

In view of these considerations the Genetics Committee in its recent report (21) recommends that close watch and control be kept over the total radiation being received by the population as a whole, with records of each person's exposures. The total dose accumulated by the reproductive organs in 30 years from all man made sources, it is recommended, shall not exceed 10 roentgens per person, on the average, but an effort should be made to keep it as far below this as possible. Further study should be instituted with a view to later revision of this figure, since present knowledge of the details necessary for a decision has been far from satisfactory. At present the American people seem to be receiving an average of about 3 of this "permitted" 10 roentgens from medical sources and a far smaller amount from fallouts and from the use of atomic energy. The medical exposures to the reproductive organs can unquestionably be decreased greatly by the use of relatively simple precautions, without impairment of medical diagnosis or treatments. But as atomic energy comes to be used to an ever greater extent, this will probably become a much more abundant source of exposure than that due to medicine unless the most rigorous measures for disposal of atomic wastes and for shielding against escaping radiation are instituted.

The boons that atomic energy offers mankind appear almost miraculous. But it will not profit us to gain any number of new worlds, if in the process of doing so we lose the best in our own natures.

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Canons of Ethics for Engineers

Foreword

Honesty, justice and courtesy form a moral philosophy which, associated with mutual interest among men, constitutes the foundation of ethics. The engineer should recognize such a standard, not in passive observance, but as a set of dynamic principles guiding his conduct and way of life. It is his duty to practice his profession according to these Canons of Ethics.

As the keystone of professional conduct is integrity, the engineer will discharge his duties with fidelity to the public, his employers and clients, and with fairness and impartiality to all. It is his duty to interest himself in public welfare and to be ready to apply his special knowledge for the benefit of mankind. He should uphold the honor and dignity of his profession and also avoid association with any enterprise of questionable character. In his dealings with fellow engineers he should be fair and tolerant.

Professional Life

Sec. 1. The engineer will cooperate in extending the effectiveness of the engineering profession by interchanging information and experience with other engineers and students and by contributing to the work of engineering societies, schools and the scientific and engineering press.

Sec. 2. He will not advertise his work or merit in a self-laudatory manner and he will avoid all conduct or practice likely to discredit or do injury to the dignity and honor of his profession.

Relations with the Public

Sec. 3. The engineer will endeavor to extend public knowledge of engineering and will discourage the spreading of untrue, unfair and exaggerated statements regarding engineering.

Sec. 4. He will have due regard for the safety of life and health of the public and employes who may be affected by the work for which he is responsible.

Sec. 5. He will express an opinion only when it is founded on adequate knowledge and honest conviction while he is serving as a witness before a court, commission or other tribunal.

Sec. 6. He will not issue *ex parte* statements, criticisms or arguments on matters connected with public policy which are inspired or paid for by private interests unless he indicates on whose behalf he is making the statement.

Sec. 7. He will refrain from expressing publicly an opinion on an engineering subject unless he is informed as to the facts relating thereto.

Relations with Clients and Employers

Sec. 8. The engineer will act in professional matters for each client or employer as a faithful agent or trustee.

Sec. 9. He will act with fairness and justice between his client or employer and the contractor when dealing with contracts.

Sec. 10. He will make his status clear to his client or employer before undertaking an engagement if he may be called upon to decide on the use of inventions, apparatus or any other thing in which he may have a financial interest.

Sec. 11. He will guard against conditions that are dangerous or threatening to life, limb or property on work for which he is responsible or, if he is not responsible, will promptly call such conditions to the attention of those who are responsible.

Sec. 12. He will present clearly the consequences to be expected from deviations proposed if his engineering judgment is overruled by nontechnical authority in cases where he is responsible for the technical adequacy of engineering work.

Sec. 13. He will engage or advise his client or employer to engage, and he will cooperate with, other experts and specialists whenever the client's or employer's interests are best served by such service.

Sec. 14. He will disclose no information concerning the business affairs or technical processes of clients or employers without their consent.

Sec. 15. He will not accept compensation, financial or otherwise, from more than one interested party for the same service or for services pertaining to the same work without the consent of all interested parties.

Sec. 16. He will not accept commissions or allowances, directly or indirectly, from contractors or other parties dealing with his client or employer in connection with work for which he is responsible.

Sec. 17. He will not be financially interested in the bids as or of a contractor on competitive work for which he is employed as an engineer unless he has the consent of his client or employer.

Sec. 18. He will promptly disclose to his client or employer any interest in a business which may compete with or affect the business of his client or employer. He will not allow an interest in any business to affect his decision regarding engineering work for which he is employed or which he may be called upon to perform.

Relations with Engineers

Sec. 19. The engineer will endeavor to protect the engineering profession collectively and individually from misrepresentation and misunderstanding.

Sec. 20. He will take care that credit for engineering work is given to those to whom credit is properly due.

Sec. 21. He will uphold the principle of appropriate and adequate compensation for those engaged in engineering work, including those in subordinate capacities, as being in the public interest and maintaining the standards of the profession.

Sec. 22. He will endeavor to provide opportunity for the professional development and advancement of engineers in his employ.

Sec. 23. He will not directly or indirectly injure the professional reputation, prospects or practice of another engineer. However, if he considers that an engineer is guilty of unethical, illegal or unfair practice, he will present the information to the proper authority for action.

Sec. 24. He will exercise due restraint in criticizing another engineer's work in public, recognizing the fact that the engineering societies and the engineering press provide the proper forum for technical discussions and criticism.

Sec. 25. He will not try to supplant another engineer in a particular employment after becoming aware that definite steps have been taken toward the other's employment.

Sec. 26. He will not compete with another engineer on the basis of charges for work by underbidding through reducing his normal fees after having been informed of the charges named by the other.

Sec. 27. He will not use the advantage of a salaried position to compete unfairly with another engineer.

Sec. 28. He will not become associated in responsibility for work with engineers who do not conform to ethical practices.

Prepared by
Engineers' Council for Professional Development
and adopted by the Executive Committee,
American Society of Safety Engineers,
December 12, 1948

AMERICAN SOCIETY OF SAFETY ENGINEERS

Membership Information

THE American Society of Safety Engineers has established the following classifications of active membership:

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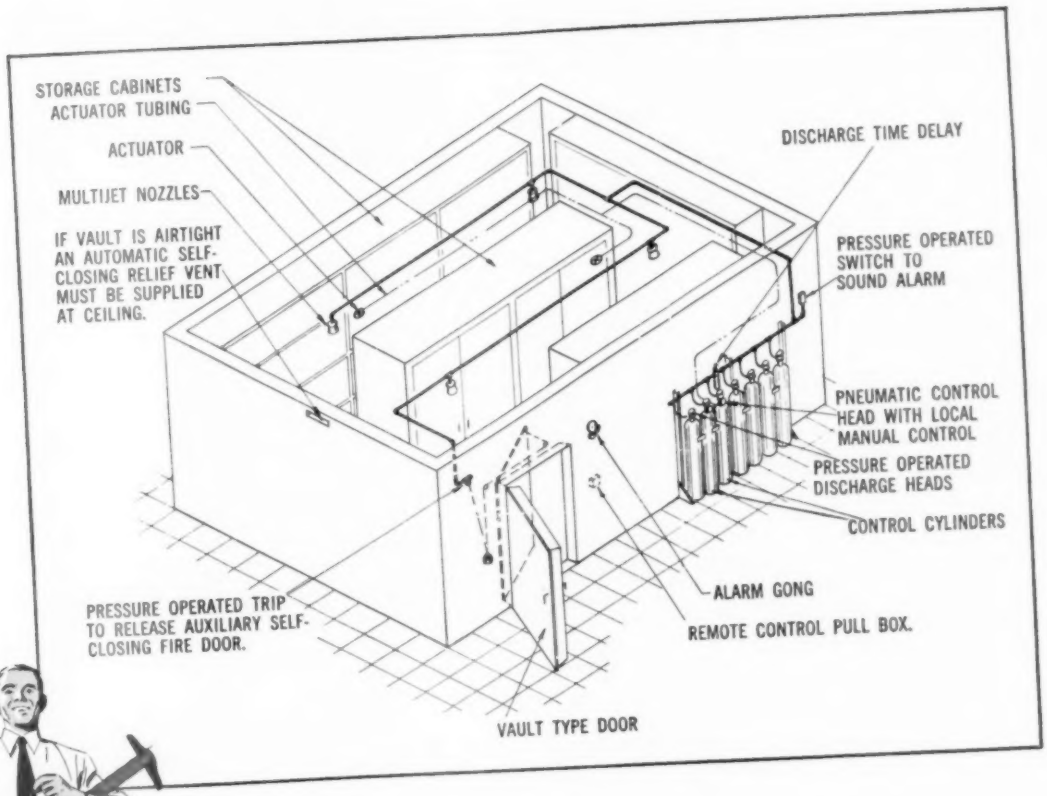
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INDUSTRIAL HEALTH

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Union Health Centers

"Union Health Centers," by the American Medical Association Committee on Medical Care for Industrial Workers. *The Journal of the American Medical Association* 160:679-682 (February 25, 1956).

THE COMMITTEE on Medical Care for Industrial Workers has been carrying on a continuing study of health centers established and operated by labor unions for a number of years. The present report is a revision of an earlier report which described the nature and operation of 12 union health centers. It includes an additional five which were surveyed in November of 1953.

With the exception of the International Ladies' Garment Workers Union which was organized in 1913 primarily for the control of tuberculosis, the union health plans have started since 1942 when the war-time freeze on wages prevented unions from bargaining for wage increases and made it necessary for them to bargain for various "French benefits" including health and welfare plans.

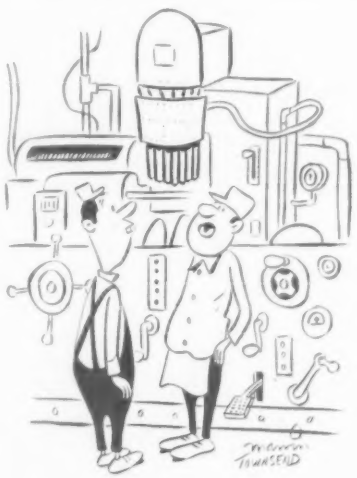
When the wage controls were discontinued, the interest in the "French benefits" remained and has actually been increasing. At the present time, there are about 11 million workers covered by such welfare and medical care plan, most of whom are covered through standard insurance procedures.

The exceptions to this rule are the United Mine Workers of America plan which pays physicians and hospitals directly for services rendered to members of the union and is now building hospitals for the use of the physicians and union members and the 17 union health centers surveyed in this report.

The report actually covers only 16 centers at the present time since the United Automobile Workers Health Institute has discontinued operations and the union is now purchasing its services through a local hospital rather than through its own plan. Eleven of the 17 health centers surveyed are conducted by the International Ladies' Garment Workers Union which was responsible for the first center in 1917.

In all of the centers except the Labor Health Institute in St. Louis, the people enrolled are automatically equal to the people eligible. In the Labor Health Institute not only the union members but their dependents are eligible so that about one-half of those eligible are enrolled in this center. The total number of union people eligible for treatment or service in these centers is 745,000 to 748,000. The number actually treated in the course of a year generally ranges between ⅓ and ¼ of those who are eligible although the extremes are from almost ½ to 1/18 of those eligible.

The centers were mostly developed primarily to provide diagnostic and ambulatory treatment clinics. They have tried to emphasize preventive medicine but have not been too successful. One plan of the 17 includes hospital service. The major problem for all of these centers is increasing the utilization by the members. The preventive medicine cannot become very effective until the utilization becomes something approaching 100 per cent annually.



"I don't know whether I'll have time to teach you to operate this machine or not—I'm due to retire in just seven years."

The centers are generally well-equipped and have adequate space for the size of the groups which they serve.

The cost of most of these plans is paid entirely by the employer with a payment varying from one per cent to six and one-half per cent of the gross payroll. The payment is usually made to the union local which pays the center a flat rate per eligible member. In the Sidney Hillman centers and some others, the employer and employee share the operating costs and in other cases the union funds have built the center and the employers finance its operation.

Of the 17 centers, eight have only union representatives on the Board of Directors. The others have boards elected jointly by unions and managements or at least representatives of both union and management and the Labor Health Institute is unique in that it also has public representatives on the Board of Directors. Each of the centers has a full-time or part-time medical director for medical administration, and some of the larger ones have medical advisory boards composed of the chiefs of services or of members of the medical staffs.

Administrative and office personnel are employed at the rate of approximately one office worker for 1,200 members of the center. Some of the office employees work only part-time and in some centers they act as clinical assistants.

—To page 106

243—Q

STONEHOUSE SIGNS

For Accident Prevention

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"No Admittance" does not always mean simply "don't come in." It is often a warning of danger beyond the posted sign.

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For there are places in modern Industrial plants where it's not entirely safe for just anyone to enter. So "No Admittance" is a sound precaution.

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ACCIDENT PREVENTION • *steel* SIGNS IN STANDARD COLORS AND DESIGNS

PERSONALS

News of people in safety and related activities

J. B. Davies

G. M. Glidden

ISEA Elects Officers

THE INDUSTRIAL Safety Equipment Association, Inc., held its annual meeting on June 19-22 at White Sulphur Springs, W. Va., and reelected as president, J. B. Davies of Mine Safety Appliances Co.

Also elected were G. M. Glidden, Acme Protection Equipment Co., vice-president; W. W. Fallon, The Pac-Kit Co., and A. F. Parmelee, United States Safety Service Co., trustees.

Fred Guilbert, Chicago Eye Shield Co., and Howard M. Weiss, Pulmosan Safety Equipment Corp., continue as members of the board. S. C. Herbine, Willson Products Division, Ray-O-Vac Co., junior past president, will remain as a member of the board for another year. Mr. Herbine has served on the board of directors of the National Safety Council and in this capacity will serve as liaison between the ISEA and the Council.

The ISEA is composed of manufacturers whose function is to exchange ideas which benefit users of industrial safety equipment and to solve problems in the common interests of industry.

The Association is divided into product groups representing all types of industrial safety equipment.

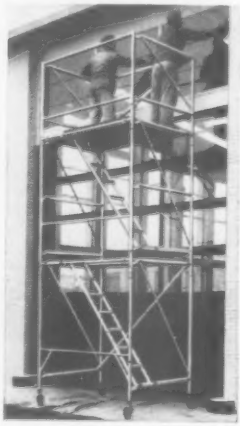
—To page 90

Aluminum Scaffolds...

by The Patent Scaffolding Co.

Scaffold Opens Like a Book

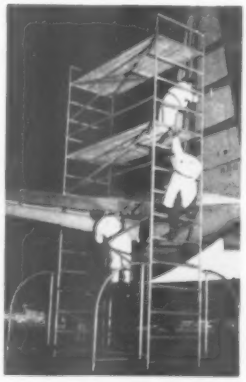
One man can erect the base section of the "Fold-A-Way"* Scaffold in less than a minute. End frames swing open sideways, while the base section is in a standing position, making an easily managed swing of about 90°. Adding additional 6′ sections takes just a few minutes. Basic unit is 4′6″ x 6′ and is 7′ high including rubber-tired casters. Ball bearing extension legs permit height adjustment up to 24″. Approved by Underwriters' Laboratories, Inc. For more information on the "Fold-A-Way"* Scaffold, write The Patent Scaffolding Co., Inc., 38-21 12th Street, Dept. N.S.N., Long Island City 1, N. Y.



(*Trade Mark)

New 4′6″-Wide Ladder Scaffold

Large platform working areas are featured in this new 4′6″-wide ladder scaffold. It is especially designed for overhead repairs, painting, cleaning, relamping and other overhead work where great mobility and stability is desirable. Outriggers may be added to give additional stability when platform height exceeds 18′. Both scaffold and separate outriggers have swiveled, rubber-tired casters for easy movement to all parts of a plant. Lightweight aluminum components make the scaffold easy to erect and move. Base section is 6′7″ high including casters. Other heights possible by combining additional ladder units 5′4″ and 4′ high and by using 24″ safety-type leg adjustment. (On all three Scaffolds.) Diagonal braces give 6′, 8′ or 10′ spans. Write The Patent Scaffolding Co., Inc., 38-21 12th St., Dept. N.S.N., Long Island City 1, N. Y.



2′-Wide Ladder Scaffold

Has same features as 4′6″-wide scaffold, but is 2′ wide. Ideal for maintenance work in narrow hallways and aisles. Rolls right through standard 30″ doorway. Can be used with diagonal braces to give spans of 6′, 8′ or 10′ platform. Compact — parts lie flat and take up little room. Write The Patent Scaffolding Co., Inc., 38-21 12th Street, Dept. N.S.N., Long Island City 1, N. Y.

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USSSCO's SAF-I-SPECTACLES bring new, attractive styling and lightweight wearing comfort to the industrial field — in a wide range of models

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Attractive, modern industrial styling

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Rich colors in Bronze, Slate Blue, Crystal, Burgundy

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Folds completely flat —unobstructed side vision— full protection— attractive —comfortable

SPATULA or RIDING BOW CABLE TEMPLES

INTEGRAL BRIDGE or ADJUSTABLE PAD ARMS

BUTYRATE PLASTIC FRAMES

Stronger—more stable—durable—longer life

Frames and lenses meet all Federal specifications

A New Frame Design

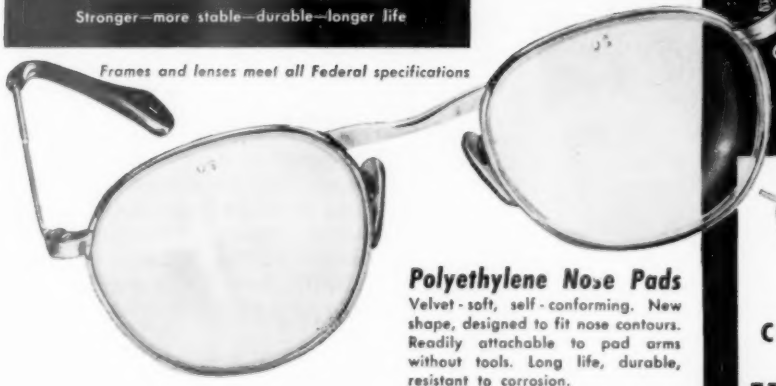
Metal Frame SAF-I-SPECTACLE

Styl-Ize A NEW LENS SHAPE

Attractive, modern industrial styling

MODERN BRIDGE DESIGN

Lighter—stronger—more attractive

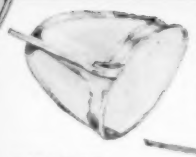


Polyethylene Nose Pads

Velvet-soft, self-conforming. New shape, designed to fit nose contours. Readily attachable to pad arms without tools. Long life, durable, resistant to corrosion.

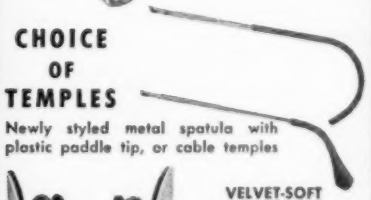
SIDE SHIELDS

Wire screen — clear or green plastic. Comfortable, full protection



CHOICE OF TEMPLES

Newly styled metal spatula with plastic paddle tip, or cable temples



VELVET-SOFT NOSE PADS

Detachable polyethylene pads mounted on special metal arms

Choice of Lens Material and Lens Shape in Styl-Ize or P-3

in both plastic and metal frames—Hardened Safety Glass or Shatterproof OPTILITE ® Safety Lens. OPTILITE safety lenses are made from an exclusive USSSCO formula of compounded resins which produce a lens with twice the strength and only half the weight of hardened safety glass. Lenses available in hardened safety glass or OPTILITE, in Plano or Prescription, Single Vision or Bifocal.

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UNITED STATES SAFETY SERVICE CO.

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USSSCO products are developed, manufactured, and sold direct to the user by the United States Safety Service Co., through a staff of trained, full-time service engineers. Look in your phone book Yellow Pages for nearest sales office, or write us in Kansas City.

HENRY K. BALL has been appointed manager of safety for Ethyl Corporation, with headquarters in New York. He succeeds the late Levan R. Fleck, who died in May.

JOHN M. ROLLINS has been named to Mr. Ball's former position as chief safety engineer of the corporation's southern region, with headquarters in Tulsa.

Mr. Ball has been associated with Ethyl for 25 years. From 1931 to 1936, he served as a field representative for the sales department in Albany, N. Y. In 1936 he was appointed safety engineer for the company in Boston. Five years later, he became senior safety engineer of the Tulsa division. When Tulsa became headquarters for Ethyl's southern region, he continued there as the region's chief safety engineer.

A native of Elmira, N. Y., Mr. Ball was graduated from Lafayette College with a BS degree in 1927. Prior to joining Ethyl, he was associated with the Esso Standard Oil Co., for three years as a test engineer at its Bayway, N. J. refinery. He is a member of the American Society of Safety Engineers, the Veterans of Safety, the American Petroleum Institute and the Mid-Continent Oil and Gas Association.

ELMER F. RESKE, manager of the Cook County Inspection Bureau, Chicago, was elected president of the Society of Fire Protection Engineers at the Society's annual meeting held in conjunction with the 60th annual meeting of the National Fire Protection Association in Boston.

Also elected to offices in the Society were: first vice-president, William G. Schultz, chief engineer and assistant vice-president, Lumbermens Mutual Insurance Company, Mansfield, Ohio; second vice-president, James J. Duggan, superintendent of mechanical and fire safety, Carbide and Carbon Chemicals Company, South Charleston, W. Va.; secretary-treasurer, Robert S. Moulton, technical secretary of the NFPA.

LEO A. MILLER has been appointed safety director for Stromberg-Carlson, a division of General Dynamics Corporation, Rochester, N. Y.

Mr. Miller has had more than 18 years of experience in safety work, and for the past 11 years was a safety engineer with the Utica Mutual Insurance Company. In this capacity he frequently served as a consultant to Stromberg-Carlson on safety matters.

Mr. Miller is a member of the American Society of Safety Engineers, and has served as chairman of the organization's Mohawk Valley Chapter.

Pointing the Way to More Effective Safety Promotion

Regularly changed messages on a Wagner Enduronamel* Board are the answer to more effective safety selling. Shown is an installation for Sealed Power Corporation, Muskegon, Michigan, which includes 30-foot panels on each side of an overpass.

The coupon will bring you free literature which will illustrate how many industries are using this new device.

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Obituaries

THOMAS J. WATSON

THOMAS J. WATSON, chairman of the board of International Business Machines Corp., New York, died June 12 of a heart attack. He was 82 years old.

When Mr. Watson took over

One man in this midget fire truck puts out the fire. Rockwood equipment makes it possible!

"Mighty Mite" puts out fire in 45 seconds

"Mighty Mite" is a swift fire fighter!

It was just a test, but the fire was real. Fuel in a pit under the tank car was set on fire. Fuel poured on top of the car from pipes was also ignited. The blaze was given a minute's start.

"Mighty Mite", loaded with Rockwood fire fighting equipment, went into action. The blaze was choked off in 45 seconds by Rockwood WaterFOG from Rockwood's Remote Manual Control Turret!

Rockwood equipment makes the small truck a big fire fighter. The Turret Nozzle does many jobs—discharges solid water stream, WaterFOG, FogFOAM, solid FOAM stream, "Wet" solid water stream, and "Wet" WaterFOG!

For complete details on this powerful Rockwood equipment send coupon below.

ROCKWOOD SPRINKLER COMPANY

Engineers Water . . . to Cut Fire Losses

Distributors in all principal cities

"Mighty Mite's" equipment includes: 4 stage centrifugal pump, 200-gallon booster tank, Rockwood Dual Suction Proportioning System for FOAM and "Wet", Rockwood Remote Manual Control Turret controlled from within the cab, Rockwood Ground Sweep Nozzles, Rockwood Remote Control Ball Valves, 2 hose reels with 200 feet of high pressure hose with new Rockwood High Pressure Handline Nozzle on each reel.

ROCKWOOD SPRINKLER COMPANY
Portable Fire Protection Division
1563 Harlow Street
Worcester 5, Mass.

Please send me your illustrated booklet on Rockwood fire fighting products.

Name.....

Title.....

Company.....

Street.....*City*.....

Zone.....*State*.....

ALL ALUMINUM

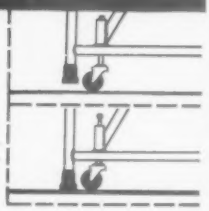
LIGHT WEIGHT RUSTPROOF EASY ROLLING

BALLYMORE SAFETY-STEP LADDERS

FROM 1 TO 4 STEPS

Ladder rolls smoothly into position on large casters

Locks to floor automatically when stepped on



Ideally suited for many jobs indoors or out where cleanliness, light weight and smart appearance are important. Sturdy all-aluminum construction reinforced for maximum strength. All parts electrically welded, no rivets or bolts to loosen. Safe, long-wearing, solid rubber-covered steps.

They are easily moved about on rollers but with no danger of "kick-out." Wide-base, rubber-tipped legs grip the floor so ladders are always stable and secure when in use.

Made in four sizes, seven models for average work levels up to 8'. Handrails are offered on the three and four step models for greater safety.

Write for complete specifications to Ballymore Company, Wayne 17, Pa.

BALLYMORE LADDERS

THE STANDARD BY WHICH SAFETY LADDERS ARE JUDGED

IBM in 1914 it had fewer than 400 employees. Today it has nearly 60,000. IBM machines have revolutionized industrial and commercial record keeping and have made important contributions to the collection and classification of accident statistics.

Mr. Watson adopted the one word slogan "THINK" which was displayed prominently throughout IBM property all over the world.

Mr. Watson had been a member of the National Safety Council's Board of Trustees since its organization in 1940.

A. A. Williams, Safety Shoe Inventor, Dies

ARTHUR A. WILLIAMS, inventor of the steel toe safety shoe and president of the Safety First Shoe Company, Holliston, Mass., died June 8 at his home at North Grafton.

Mr. Williams was born December 16, 1879 at North Easton, Mass., and started in the shoe business in 1900. The following year he established his own factory and in 1903 produced the first pair of safety shoes for use in foundries. In 1910 he founded the Safety First Shoe Company and the Good Will Shoe Company in Holliston.

Arthur A. Williams

In 1925 he manufactured the first steel box toe safety shoes and 15 years later this invention, generally accepted throughout industry, was recognized by the National Association of Manufacturers with a Modern Pioneer Award.

He was a director of the International Safety Products Company of Rushdon, England, which manufactures and distributes safety shoes throughout Europe. He was also a director of Graton & Knight Company of Worcester.

Mr. Williams was a charter member of the National Safety Council and throughout his life he was engaged in many civic and philanthropic activities. He is survived by his widow, three sons, a daughter and two brothers.

Two-Way Radio Saves Three As Helicopter Lands in Gulf

A SMALL portable two-way radiophone was credited with bringing timely aid to three men when a helicopter lost suspension and windmilled into the Gulf of Mexico more than 25 miles off the Louisiana coast recently.

The aircraft, owned by General Air Transport of Louisiana, was carrying two passengers in addition to the pilot, and was en route from an off-shore drilling rig to Morgan City, La., 70 miles away, when the mishap occurred.

Although it had lost its power, the helicopter made what was described as a safe, controlled landing by means of auto-rotation of its blades. It settled into the water and remained afloat in heavy seas until a rescue boat from the rig reached it. As it descended the men radioed to the rig with their Motorola Handie-Talkie radiophone.

Officials of the Sinclair Oil & Gas Co., operator for the group which includes Peoples Production Co., El Paso Natural Gas Co. and Sohio Petroleum Co., said there is no doubt that the three men were saved undue exposure by two-way radio, since the aircraft landed in five-foot waves in a remote section of the Gulf, far out of sight of the drilling rig and many miles from shore.

The radio unit was aboard the helicopter in compliance with the operator's rule requiring a two-way radio operating on the company's assigned channel be carried on each flight.

MICRO *precision switches*

...THEIR USE IS A PRINCIPLE OF GOOD DESIGN

MICRO SWITCH Trip Control installation. Each operator must operate two switches before press will work

MICRO SWITCH Trip Control speeds production, provides safety to operator and equipment

Whether a press is operated by one, two, three or four or more operators, MICRO SWITCH Trip Controls make sure it cannot operate until every man is at his safety station.

Increased production comes from:

- Instant electrical response
- Feather-touch operation
- Easy control changes
- Decreased operator fatigue

Increased safety comes from:

- Two-hand operation
- Cannot be "cheated"
- Inoperable if any component fails
- Interlock prevents power stroke while changing dies.

New machines may be made safer and more versatile by the use of MICRO SWITCH Trip Controls. Old equipment may be electrified and modernized to bring productivity up to today's requirements.

A Trip Control installation consists of only one compact control box, two hand switches per operator, one foot switch per operator (if desired), lock-out switches (if desired) and clutch-actuating equipment if machine is not power-clutch actuated.

Hand switches have snap-action contacts, which require only short, easy actuation. Both must be operated within a set time interval. The compact control box is easy to mount. A lock on the cover permits only authorized personnel to make control changes. A hinged, dead-front panel inside isolates all current-carrying components.

MICRO SWITCH Trip Controls have wide range of uses

These controls offer a choice of desirable single-stroke control for positive mechanical clutch machines and automatic cycling control for friction clutches and hydraulic and pneumatic equipment.

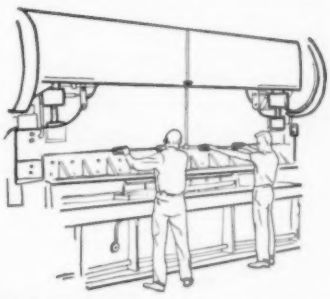
FOR SMALL PRESSES

Provides fast, safe, effortless operation of small two-hand presses, riveting machines, etc.

ONE HAND—IF NECESSARY

Where one hand is required to hold stock in a protected or enclosed die, control is quickly converted to one-hand operation.

FOR USE ON LARGE PRESSES



Makes operation of large presses safe and less tiring. Any number of operator stations may be "wired into" the control circuit.

SEND FOR CATALOG 65 TODAY

Gives complete description of all controls and clutch actuating equipment.

Let us send you complete information on MICRO SWITCH *Trip Control and the name of the distributor nearest you.*

MICRO SWITCH

A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

What caused that accident?

What would have prevented it?

ACCIDENT POST-MORTEMS

A review of cases by Franklin G. Pater, *Industrial Department, NSC*

Exhaust Fan Pulls in Poison Vapors

Two men were working in a building adjacent to some cooking vats. The building had an exhaust fan in operation and the windows near the vats were open and broken.

Fumes from the cooking vats were sucked in by the exhaust fan and inhaled by the two men, who were working near the open windows. Both were temporarily asphyxiated. One man realized he was being overcome and moved into a fresh air area where he recuperated by himself and continued working during his shift.

The other worker fell to the floor, striking his head. He was revived and instructed to sit outside until he recuperated. Rather than return to work, he went home.

Next day the injured employee did not report for work as scheduled. At the insistence of the personnel manager, the man's wife took him to a clinic for an examination. He was admitted to a hospital when it was found that he had suffered a slight concussion.

The company investigated the accident, and came up with the following report:

1. The broken windows have been fixed.

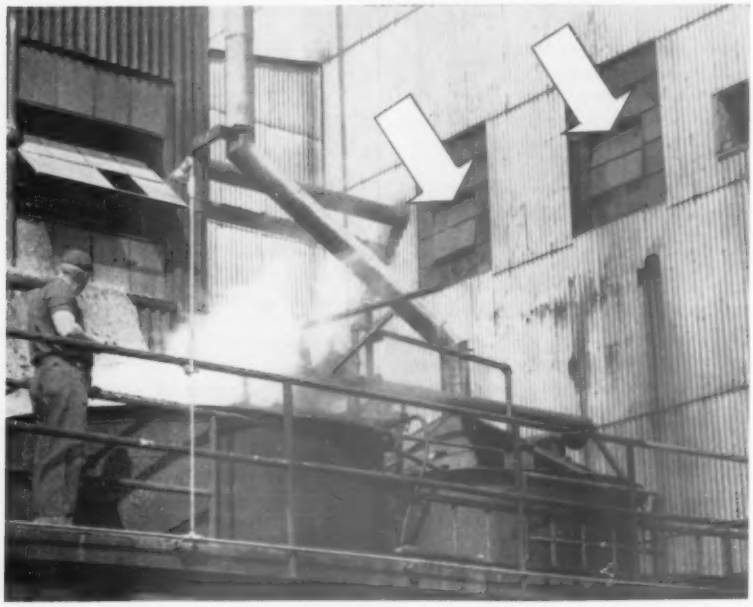
2. Immediate plans are being made to extend a vent from the top of the cooking vats to a point above the entire area.

3. Personnel in the building have been instructed about the odor of the fumes coming out of the cooking vats and that they should immediately seek fresh air upon exposure to the fumes.

4. A suggestion has been submitted that the windows in the building facing the cooking vents should be locked shut at all times.

Comment. If the fumes from these cooking vats are as hazardous as they appear to be here, employees in the surrounding area should be supplied with respiratory protection for emergency use, and instructed in the use of the equipment.

The solution might be to block out the windows and put air intakes on the other sides of the building away from the cooking area.



COOKING VATS send toxic vapors through open windows (arrows) where fumes overcame two workers.

Short Ladder Causes Fall

A sheet metal worker was instructed to install a regulator in a ventilating duct that was installed near the ceiling. In order to reach the point of operations a ladder had to be used.

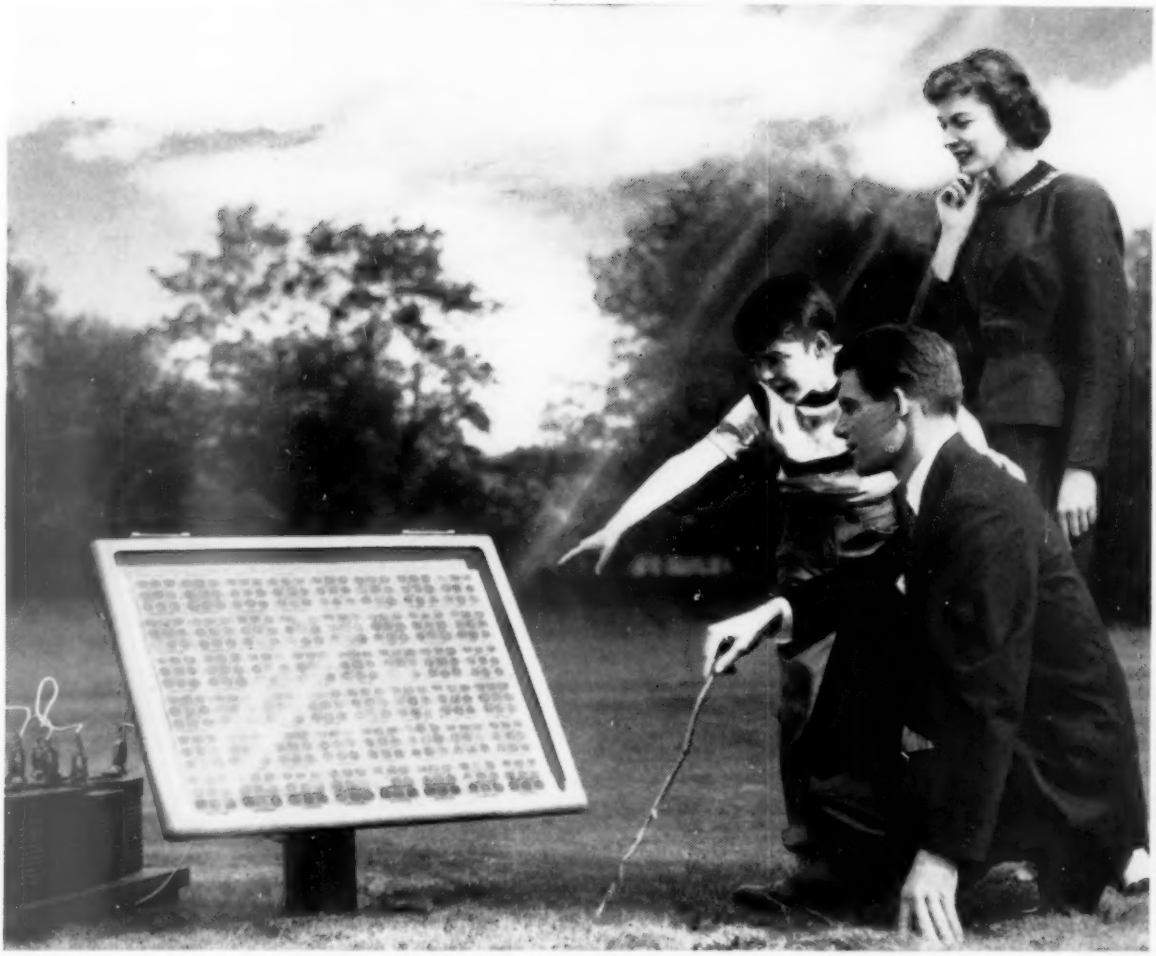
Because the floor area was nearly covered with insulating panels, the ladder was improperly placed against an intermediate beam several feet lower than the ventilating duct. The top of the ladder lacked several inches of touching the ventilating duct.

A tie-off rope was attached to the right side of the ladder near the top and to a hanger rod which supported the duct. There was considerable slack in the tie-rope after it was fastened.

The ladder, which was equipped with rubber safety shoes, was inspected in place by one of the contractor's safety engineers, who said it was a satisfactory installation.

The workman went up the ladder. When he placed his weight on the first rung above the support beam the beam acted as a fulcrum, allowing the top end of

—*To page 103*



Something New under the Sun. It's the Bell Solar Battery, made of thin discs of silicon, an ingredient of common sand. It converts the sun's rays directly into usable amounts of electricity. The storage batteries beside the solar battery store up its electricity for night use.

Bell System Solar Battery Converts Sun's Rays into Electricity!

Bell Telephone Laboratories invention has great possibilities for telephone service and for all mankind

Ever since Archimedes, men have been searching for the secret of the sun.

For it is known that the same kindly rays that help the flowers and the grains and the fruits to grow also send us almost limitless power . . . nearly as much every three days as in all known reserves of coal, oil and uranium.

If this energy could be put to use—instead of going to waste—there would be enough to turn every wheel and light every lamp that mankind would ever need.

The dream of ages has been brought closer by the Bell System Solar Battery. It was invented at the Bell Telephone Laboratories after long research and first announced in 1954. Since then its efficiency has been doubled and its usefulness extended.

There's still much to be done before the battery's possibilities in telephony and for other uses are fully developed. But a good and pioneering start has been made.

The progress so far is like the opening of a door through which we can glimpse exciting new things for the future.

Great benefits for telephone users and for all mankind may come from this forward step in putting the energy of the sun to practical use.

BELL TELEPHONE SYSTEM

Built for Better Protection
DOCKSON FACE SHIELDS
MAXIMUM PROTECTION—against the hazards of buffing, polishing, grinding, plating, scaling; flash, butt and spot welding; hot-liquid splash, acids or chemicals.
YOUR DOCKSON DISTRIBUTOR—a selected specialist, stocks a complete line of Dockson Products to give you fast service and personal attention. We back our distributors 100%.
WRITE FOR YOUR DISTRIBUTOR'S NAME AND OUR COMPLETE CATALOG OF HEAD AND EYE SAFETY EQUIPMENT
Dockson CORPORATION
3439 WABASH • DETROIT 8, MICH.

Shared Responsibility

—*From page 19*

dent prevention and it is up to management to provide direction and support for safety campaigns. The common denominator of all safety programs must be a combination of five basic elements:

1. Good housekeeping. Safety and clutter, like the mongoose and the cobra, are natural enemies.

2. Protective equipment and emergency procedures.

3. Safety supervision and inspection. This would include the preparation of safety rules and their enforcement, accident investigation and analysis. And it would include action to prevent the reoccurrence of accidents.

4. Sanitation and medical facilities.

5. Safety education. This means the indoctrination of new employees, building safety into job training and holding safety meetings. It means keeping the safety message before all members of the organization all the time.

It is possible, of course, for management to blueprint an accident prevention effort on the basis of these five elements and delude itself into believing that complete safety has been achieved.

Let me give a useful illustration. In the Pacific Coast pulp and paper industry we thought we were all for safety during the years before the war.

Most of our member mills probably considered their safety standards adequate for the times. But there was a missing link. The proper safety climate had not been established. And our accident rate proved it. From 1923 to 1945 the sum total of our safety effort was a drop of around four points in lost-time injuries—from 43.50 to 39! No such rate could be tolerated today.

Then something happened.

Fortunately the pulp and paper industry on the Pacific Coast had always enjoyed excellent relations with the two labor unions representing our employees: The International Brotherhood of Papermakers and the International Brotherhood of Pulp, Sulphite and Paper Mill Workers. Through the years we had bargained collectively with considerable vigor, without losing respect for the other side of the bargaining table. Bargaining was — and is — on an area-wide basis and the wage contract agreed upon applies to the workers of all mills in the Pacific Coast Association of Pulp and Paper Manufacturers.

During the course of our wage negotiations in 1945, the two labor unions — representing nearly 50 local unions, by the way — proposed a joint labor-management attack on accidents in the pulp and paper industry. They fully recognized that safety cannot be covered in any adequate way through a labor contract and saw considerable merit and wisdom in the joint approach.

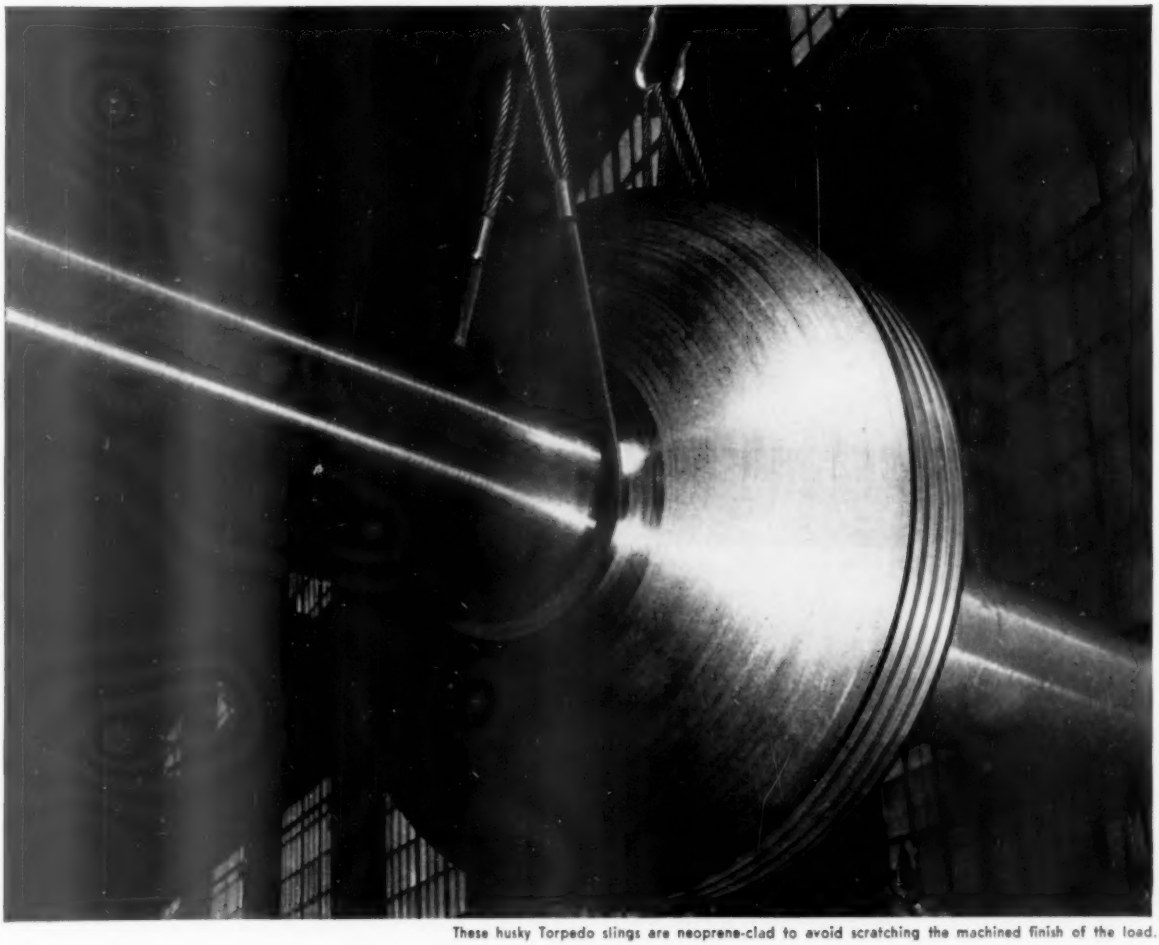
So did management. We agreed with the idea at once. Thus began one of the most unique developments in labor-management relations throughout all of American industrial history. We had discovered, at least in our industry and in our area, the triangular method of accident prevention.

To put the proposal into practical effect, the unions suggested that we establish an annual series of joint labor-management safety conferences to be held in Oregon, Washington and California. The purpose of the conferences was to be "the consideration of safety education, accident prevention and first aid." From that day to this we have never wavered from this purpose and the results of the whole experiment speak for themselves.

Our first conference took place in Olympia, Wash., in 1946, with 35 member mills taking part. It was recognized that the conference would be conducted in a vacuum unless we also developed a foolproof system for reporting back to the mills, so that every employee was familiar with the topics discussed and the solutions or safety procedures recommended. Thus the conference machinery of discussions, clinics, talks and feed-backs was shifted into gear and off we went.

From that first conference the accident rate began to drop. Our rating in 1945, as mentioned, was 39. In 1946, the year of the first conference, we were able to lower it several points. By 1952, we had cut it back successively each year to 10.06, a drop of nearly 30 points.

Last March we held our tenth annual Joint Labor-Management Safety Conference of the Pacific



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3. Independent wire rope core is provided as a means of combating distortion and crushing.

The standard Torpedo is supplied in a wide range of sizes —¼-in. to 2-in. diameter. It is available in two rope constructions, 6 x 19 class and 6 x 37 class. Moreover, in sizes from ⅜ in. to 1¼ in., we now make a special type of Torpedo with extra-high flexibility and resistance to kinking.

If it develops that other kinds of slings better meet your needs, Bethlehem can furnish them, of course. We make *everything* in slings, including the single-part, braided, grommet, and bridle types. Ask for full details.

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BETHLEHEM STEEL

Coast pulp and paper industry. It was a time for stock-taking, of course. And we allowed ourselves at least a measure of satisfaction from the fact that our 1955 accident rate—with 39 mills participating—was down to 6.40 accidents per million man-hours worked, as against 11.9 for the pulp and paper industry as a whole. The frequency of injuries had been reduced by 84 per cent while the number of workers in Pacific Coast pulp and paper mills had increased by more than 50 per cent, from 15,000 to 22,500. The actual number of injuries in 1955 was 291. With fewer workers in 1946, the number of injuries in that year exceeded 1,000.

Reduction of an accident rate, however, permits only a momentary burst of pride. For a 6.40 accident rate is still too high and we have found it increasingly difficult to reap the spectacular gains made during the initial phases of the experiment.

Moreover, the moment you take pride in a good record is the time to look for trouble. At our tenth conference a Los Angeles paper converting plant was awarded a trophy for a lost-time accident rate of zero during 1955. But within a few days the record was broken when a man fell from a ladder, breaking two bones in his foot. Shortly afterward a second man injured his hand in a winding belt. Luckily, nothing more serious occurred.

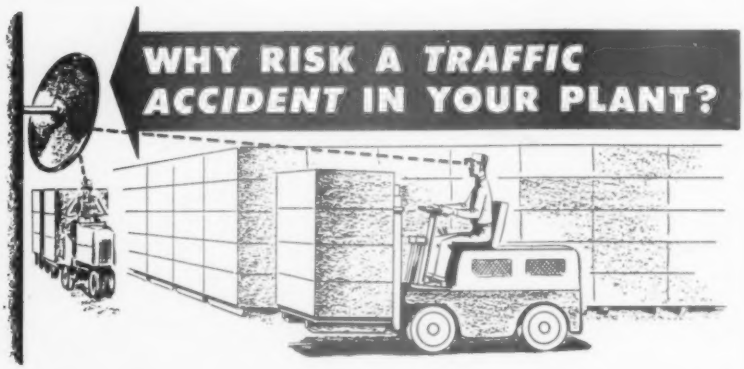
I am quite familiar with the details. The mill happens to belong to my own company.

At the same time, a drop of more than 32 points in lost-time injuries speaks volumes in favor of our labor-management safety conferences. We found, for example, that had we maintained the accident rate of 1945 during the ten-year conference period there would have been 10,000 additional disabling injuries. We can argue soundly, it seems to me, that those accidents were prevented by our conference program. It is now safer to work in a mill of the Pacific Coast pulp and paper industry than it is to stay at home.

From the first year of the program, active union-management committees were established at each mill. Through the years these committees have continued to meet regularly, often once a week, to review plant accidents, investigate causes, discuss safety measures. Again at the mill level, considerable attention has been given to encouraging safety-consciousness on the part of individual workers through bulletins, posters and meetings—in fact, up to and including safety book matches.

To maintain interest throughout the industry, the manufacturers' association publishes every month the accident frequency rate of member mills. And at every annual conference friendly competition among the mills is encouraged by the presentation of awards based on the five-year frequency rate, the lowest frequency rate for the year and for the lowest injury rate in each of the three states.

Each conference meets and deliberates under two co-chairmen, one representing labor and the other management. It has always



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He came to make a talk on

"good human relations in business"

...and stayed to see it at work

Wausau Story

by **WILLIAM G. CAPLES**
Vice-President, Inland Steel Company

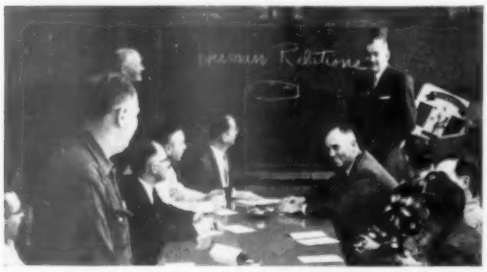
"I CAME to Wausau to talk on human relations in business. But I think I got more than I gave in my trip.

"Out at the Wausau Iron Works where general manager Arthur Keene showed me around, I stopped at a blazing forge to talk to Henry Wimmer. A 'village smithy' right out of Longfellow, he plies his trade amidst surroundings of a modern industrial plant. Still important work—and it must be satisfying, for Henry has been a blacksmith 45 years. Raised *14 children*, too. Human relations in industry gets down to a man and his job and how he likes it.

"From what I saw, folks in Wausau like their work. They don't have to get away from home to be a success. I chatted with a group at the Mosinee Paper Mills who are studying human relations. It's not all theory with them. I could tell from a trip through the mill with general manager Norman Stone that they put it into daily practice. Later when I visited the home office of Employers Mutuals I learned that human relations is an important part of accident prevention work. It helps lower workmen's compensation insurance costs.

"People working in an environment that makes for good human relations—that's the Wausau Story."

. . . the "village smithy" stands amidst modern production scene



. . . human relations not all theory

Employers Mutuals of Wausau are "good people to do business with"

We at Employers Mutuals were especially happy to have an expert in human relations like Mr. Caples visit our town. What he saw and commented upon so warmly has been our way of doing business ever since we wrote our first workmen's compensation insurance policy in 1911 for Mosinee Paper Mills. Safety rules are a list of do's and don't's. *But safety is also a man's attitude toward his job.* Our accident prevention program stresses that fact.

Yes, human relations are important in our Wausau way. That goes for *every* type of insurance we write—fire, liability, automobile as well as workmen's compensation. And it's just as true in your home city as it is in Wausau. *For there's a little bit of Wausau in all 90 cities where we have offices.* We'd like to do business with you and we think you'll like the Wausau way of doing business. Call our nearest office, or write Employers Mutuals, Wausau, Wisconsin.

Employers Mutuals *of* Wausau

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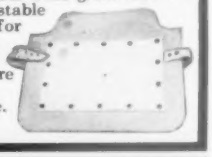

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been agreed that the meetings should not be sounding boards for the settlement of local plant disputes, which can be solved more effectively in the mill itself. The deck is thus cleared for consideration of ideas which can be used by individual delegates to improve their own safety programs. We can also count on many visitors from other parts of the country to contribute their own recommendations for accident prevention, based on their regional experience.

Now it is true that the joint labor-management safety conferences of the Pacific Coast pulp and paper industry grew out of a history of successful collective bargaining. We cannot deny that the soil for this type of experiment had been well prepared by a pattern of cooperation which had been long established. There have been attempts to adopt the technique elsewhere and not all of them have been successful. We are familiar with many accident prevention campaigns which collapsed after the initial enthusiasm had waned.

Nevertheless, I commend our experiment as one approach to the problem of accident prevention.

Safety, like many other aspects of our modern technological world, is here to stay. Management must think first of the humanitarian considerations of accident prevention. Every effort must be made to see that the man on the line is sent home to his family sound of mind and limb.

Management has discovered, however, that safety pays and that accident prevention is another effective way of protecting the total corporate investment. Safety helps to reduce insurance costs, eliminate waste and prevent loss of valuable property. While serving its humanitarian purpose, safety also protects management's investment in its most valuable asset: skilled and experienced manpower. And that investment will loom larger as the technological revolution advances and jobs in industry become more highly skilled and better paid.

In connection with this subject of cost-saving it is often wrongly assumed that only the large cor-

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Local boy makes good

WHEN THE LATE Ebenezer Hubbard, a patriotic Concord man, left a bequest for a local statue, there luckily happened to be a real sculptor close at hand.

Even more luckily, young Dan French had never yet sculped a whole statue—had, in fact, recently started by whittling on turnips. So he'd take the job for expenses, and glad to get it.

Two years later, Daniel Chester French's first statue went up. And Mr. Emerson, a neighbor, gladly obliged with a little verse to go under it, ending—

"Here once the embattled farmers stood,
And fired the shot heard round the world."

Now, during his great lifetime, Daniel French was to make many more statues, but his fame needs only two to rest secure. One is the massive, brooding figure in the Lincoln Memorial. The other is his first: the big, bold, living bronze of the Minuteman of Concord.

When, in 1941, a symbol of American strength was sought, the President picked the Minuteman. Ever since, the Minuteman has been the emblem of the great savings program that helped—and still helps—keep America and her people safe and secure. This year, the 15th anniversary of U. S. Series E Savings Bonds, finds 40 million Americans owning 40 billions of Bonds. Are you among them? For your own security—and the nation's—invest in Savings Bonds regularly. And hold on to them!

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Photo courtesy Stokely-Van Camp, Inc., Frozen Food Division

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If you're interested in cutting costs by speeding production—if cleaner, safer air is important in your plant—write now for complete information on the OCM and name of your nearest supplier.

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poration can afford effective safety programs. Studies demonstrate that the small company also can cut costs and get a higher return on investment through systematic accident prevention. And yet, as a group, small companies are generally found in the rear guard of the national safety movement.

For the small concern safety is an effective form of accident insurance. Actually a large corporation might be able to survive an accident which could ruin a small company.

Safety, in short, is "a game in which everyone can win." That apt description was given at one of our Pacific Coast Joint Labor-Management Safety Conferences by William Riggs, international representative of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers.

It is the mutual responsibility of management, labor and the individual worker to see that common-sense rules of the game of safety are drawn up and applied. Management also shares with labor and the individual worker the responsibility for seeing that the game never ends.

The President's Medal

Awards made by the National Safety Council for successful application of artificial respiration

MARCEL ROY, draughtsman Shawinigan Water and Power Co., Shawinigan Falls, Que.—drowning. Certificates of Assistance to ROGER LAVALLEE and LUCIEN GAUTHIER.

DAN HOLLINGSWORTH, experimental operator—1st, Continental Oil Company, East Hartford, Ponca City, Okla.—gas asphyxiation.

PAUL BRUNER, electrician, Inter-State Power Co., Oelwein, Iowa — suspension of respiration due to choking on piece of meat.

MRS. NOMA ANDERSON, assembler, The Indiana Steel Products Co., Valparaiso, Ind. — electric shock.

Post-Mortems

From page 94

the ladder to go forward and the feet of the ladder to leave the floor. The ladder slipped backward until stopped by the tie-off rope. Since the rope was tied only to one side of the ladder it allowed the ladder to swing sideways and the man fell to the floor.

Comment. This ladder was both too long and too short. It was too short for the job because it could not be placed with a support point at the top but fell short of the top support by several inches.

It was too long in that the support that did hold the ladder was not at the top of the ladder.

In the third place, the employee should never have climbed above the top support point of the ladder.

The man should not have done the job without a ladder long enough to touch the support point at the top of the ladder. The man was standing on a teeter-totter in a vertical plane, with no counteracting weights at the bottom of the ladder. The foreman on the job must have known that the ladder would be too short for that particular job and should have instructed the man to get a ladder long enough.

Wire from Washington

—From page 14

subcommittee to study airspace use problems, and this committee started its promised comprehensive study with an on-the-spot investigation of a recent accident. Senator Smathers asked the Senate Commerce Committee to investigate safety standards and whether the CAA "is keeping up with the increase in the volume of air traffic." Senator Humphrey called upon the CAA and the CAB to direct airlines to take known safety precautions which are not now universally used.

The Legal and Monetary Affairs Subcommittee of the House Government Operations Committee began hearings on civil aviation problems, starting with an inquiry into the report made by the

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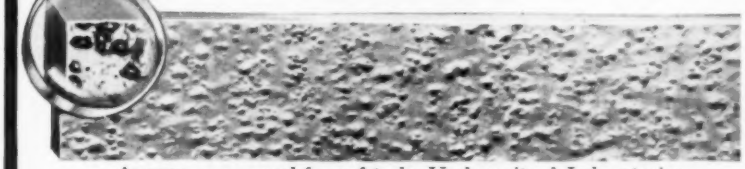

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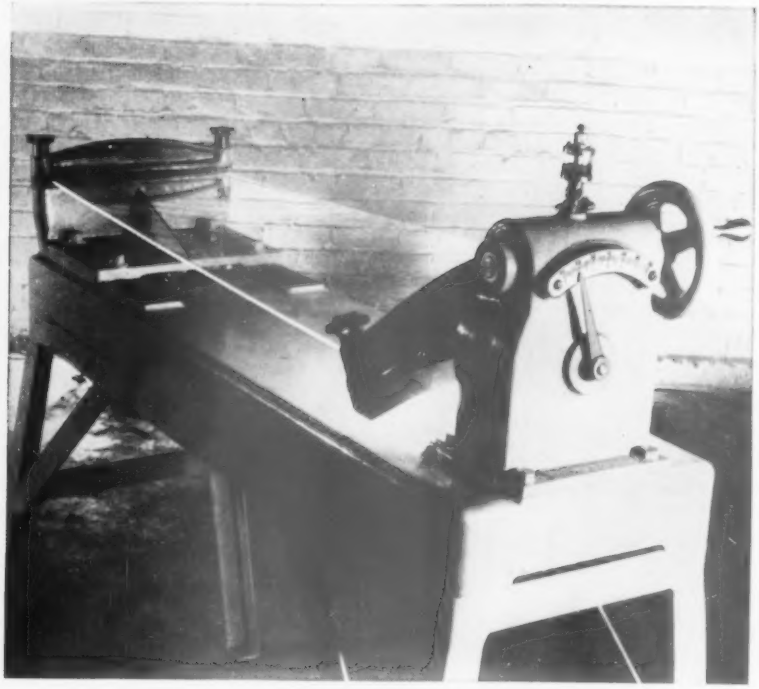

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Aviation Facilities Study Group at the request of the Bureau of the Budget. This Group found, among other things, that risks of mid-air collisions had reached critical proportions. (See "Wire", March 1956). The administrative agencies were likewise deeply involved in matters having safety import. The Commerce Department announced a list of projects to receive Federal Aid airport funds, and stated that safety is the first consideration of the airport program. The CAB announced a proposed rule-making proceeding for a more rigid and universal application of fire protection devices in airplanes. The CAA announced the organization and function of Aviation Safety District Offices, and also the signing of a contract for a study of physical standards and medical examination procedures affecting airplane pilots.

Marine Safety. The President has signed into law a number of marine safety bills: P.L. 548 (S. 460) requires life preservers for river steamers; P.L. 549 (S. 743) authorizes biennial inspection of the hulls and boilers of cargo vessels; P.L. 550 (S. 1378) clarifies authority over aids to navigation on fixed structures in navigable waters; and P.L. 552 (S. 1791) requires lights to be carried on motor boats under 65 ft. long.

P.L. 519, which brings all previously uninspected vessels carrying more than six passengers for hire under inspection laws, is in the process of implementations. The Coast Guard has completed a preliminary draft of regulations which would affect more than 8,000 passenger vessels; these regulations will be considered at a public hearing in September.

H.R. 4090 was approved by the House; it would require installation of automatic radio call selectors on all cargo vessels carrying fewer than two radio operators.

Home Safety. The House Committee on Interstate and Foreign Commerce approved H.R. 11969 (a new bill in the place of H.R. 2181) which would require all household refrigerators manufac-

tured for shipment in interstate commerce to be equipped with a device which will meet standards established by the National Bureau of Standards of the Department of Commerce, in order to make it possible for the door to be opened easily from the inside.

Although the Committee heard testimony of the need for a continuing study of the amount of pressure required for such doors (see "Wire," July, 1956), the Committee's report says that "it is imperative that the Congress enact legislation to minimize these deaths insofar as possible."

The Committee concluded that although publicity campaigns directed toward alerting parents to the dangers of children suffocating in refrigerators are helpful, "they are inadequate to meet the problem." The same judgment was reached as to state laws and local ordinances requiring the removal of door latches before abandoning refrigerators.

Government. The Senate Committee on Government Operations held hearings on S. 3517 (see "Wire," January, 1956) to provide for the reorganization of the safety functions of the Federal Government. The president of the AFL-CIO expressed an "extremely critical" view of the lack of action by the Federal Government in affording protection to workers on the job, and asked for action on the proposed legislation for grants-in-aid to states to be used on a matching basis to strengthen state safety programs and also on legislation dealing with safety in mines (other than coal mines) and quarries.

A special Senate subcommittee concluded hearings on S. 3287 which would authorize the training of federal employees at public and private facilities.

Gilbert K. Chesterton, the portly English author, was introduced to a skinny playwright who remarked:

"If I were as fat as you I'd hang myself."

"If I ever decide to do so," Chesterton replied, "I'll be glad to use you as a rope."

There is a better way to register safety messages!

"Safety messages *that get read*" the National Safety Council confirms, " do help reduce accidents." Yet how difficult it is to get them read – particularly the familiar simple cautions we are all so prone to disregard.

Here's one way to do it

AJAX CUPS put your safety message right in your worker's hand, several times a day, at just the moments when he is relaxed, receptive, ready to read.

At the same time, these crisp, clean AJAX Cups provide the most convenient, comfortable drinking water service, boost worker morale, and reduce the hazards of transmitted infections.

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Industrial Health

—From page 86

Most of the physicians also work part-time, sometimes at the center on a daily program and some only on a consultation basis. The New York International Ladies' Garment Workers Union has a staff of 10 full-time physicians as well as a number of part-time ones, but few of the other centers have more than one full-time physician. Most centers employ only specialists. Payment to the physicians is usually at a flat rate per hour ranging from $4 to $12.

All the centers provide the same general type of service. Their objective is ambulatory diagnostic care, and few also provide therapeutic care with some emphasis on physical therapy. Several operate their own pharmacies. Two centers have arrangements for hospital care by staff physicians, and one provides some home care.

A novel departure in providing diagnostic services to union members is the mobile health survey program of the International Ladies' Garment Workers Union at Harrisburg, Pennsylvania. Since the local union there works in a large number of plants disbursed over a radius of 67 miles, the diagnostic services had to be mobile and this set-up was chosen as the most practical.

It is unique in that the mobile unit is conducted by a survey team consisting of a trained laboratory technician and a medical case worker. They take carefully documented case history on each patient and collect urine, blood and other specifications for laboratory examination.

The case histories and laboratory reports are reviewed and evaluated by the medical director as normal, qualified positive, positive and urgent, and the patient's personal physician is notified of the findings. Specific recommendations are also made to the patient and follow-up is made by the mobile unit in those cases classified as urgent.

An interesting discovery of the survey teams is that only 3/10 per cent of the union members examined were found to have no personal physicians.

Island Paradise

—*From page 35*

frequency rates. The years 1952 through 1955 saw the following downward trend for the industry: 32.166, 29.994, 25.262 and 19.65.

Of the 27 sugar companies included in these average figures, the lowest five companies range in frequency from 1.40 to 3.10. Progress is being made, but it is evident that much work remains to be done.

The sugar plantations, often working through their agencies, recognize this challenging situation. The agencies, for those unfamiliar with the term, are companies which provide many important and essential services to their companies. Financing and management, insurance, purchasing, industrial relations and, among many other types of assistance, safety engineering is usually provided. The agencies serve not only sugar companies, but also pineapple, stevedoring, and other industries.

Four agency safety engineers are the key men in this story. As the drop in frequency rates in sugar indicates, they have been doing an effective job. They are doing well at all the usual things, getting better acceptance of personal protective equipment, improved machine guarding, fire protection and the many other factors which bear on safer operations. They are building better attitudes toward safety and better safety organizations. Each, by himself, has done much training of both management and nonmanagement employees.

The difference, perhaps, lies with the fact that one day this group of men were discussing their problems and agreed that individually they could not do the educational job that was needed. They thought that, perhaps, at least part of this major problem could be solved by combining their efforts.

Robert Alden, safety administrator, Castle & Cooke, Ltd.; Dr. Ernest Hood, training and safety director, C. Brewer & Co., Ltd.; James Witten, safety director, American Factors, Ltd.; Thomas McCabe, training administrator, Castle & Cooke Terminals, Ltd.; and E. R. Turner, chief of the loss prevention and engineering department, Alexander & Baldwin, Ltd., got their heads together on a plan to solve their problem.

They wanted to develop a basic course in industrial safety that would bring to at least key people in industry a much broader understanding of the various aspects of the subject. They felt that the training they had done on one subject here and another there was not getting across a complete picture of the problem. So they sat down together in a number of meetings and decided what they would cover in such a course. They worked out assignments so that the work would be fairly distributed.

From their knowledge of the several islands and the people on them, they determined what specialists could be brought in on specific subjects or demonstrations. They decided what top management men in the different

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communities would lend their support to this safety training effort by speaking to registrants at the luncheon and dinner meetings. Then, separately, each man developed his own outlines on the subjects he would cover. They were brought together and were discussed in the group toward further improvement of them. The course looked good on paper.

Each agency safety engineer approached his own company with the idea and with the work that had been done. The companies bought the plan, recognizing that each safety engineer would normally be doing about the same amount of training work anyway on the various islands, and that as a team they could do a far more effective job. They could bring safety training to those companies outside the agency groups that had no training facilities of their own. Increased understanding of and interest in safety on a community-wide scale would help attitudes, interest and results in the companies the agencies served.

The next big problem for our four men was to solve the problem of getting people to attend the course. They could easily get employees from the companies their agencies represented, but, they wanted this training to go beyond that group and into other companies. They also wanted some organization to coordinate all the publicity, make the arrangements, handle all of the administrative details and do the needed printing.

A natural answer to this problem was to approach the Hawaii Employers Council.

The Hawaii Employers Council is an employers' association which serves its 194 member companies with a wide variety of industrial relations and labor relations services. Many conferences, week-long institutes, seminars and workshops round out an inspirational and educational program for its member companies. The conference program, along with the collective bargaining, research and public relations work of the 33-person council staff, is aimed at improving the attitudes and methods of member companies toward bettering employee relations. Its member companies employ about 48,000 people. This number comprises about one-half of all employees of private industry in the Territory of Hawaii. Only 11 of the Council's members have more than 1,000 employees, while more than half have fewer than 100 on their payrolls.

The Council had ample experience in arranging conferences and training sessions, had a staff and good representation on the various islands and was equipped to coordinate the course that the safety engineers suggested. Alone, the safety engineers would have been unable to handle the publicity, arrangements and other details. It would have been difficult for them to make these training sessions available to other companies than their own. The Council, on the other hand, wanted to bring more services in industrial safety to its members, yet needed qualified instructors. So the safety engineers and the

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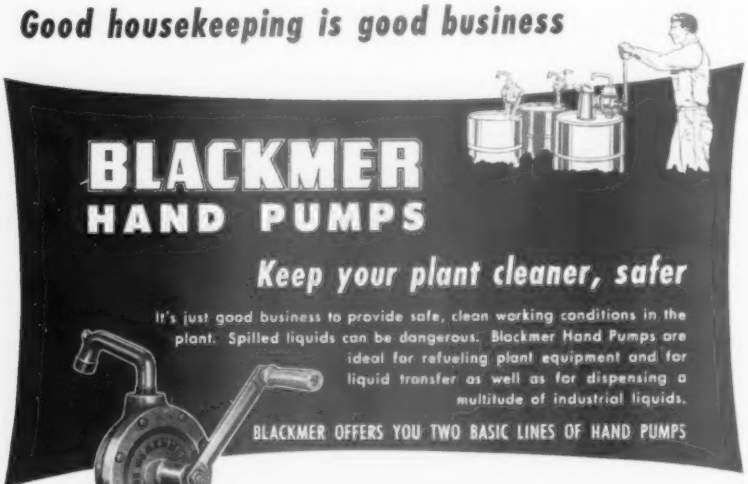
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Hawaii Employers Council joined forces.

Briefly stated, the safety engineers proposed that they develop a 4½-day course not only for the people in the companies their agencies represented but for the many other companies which were members of the Council. Many of these other companies were of such a size that they couldn't logically afford full-time safety engineers of their own. In addition, it was planned to invite participation by companies outside the Council membership and by governmental agencies. This way benefits would accrue to a wide group in each community where training sessions could be held.

As sessions developed on the various islands of Oahu, Maui, Hawaii and Kauai, local safety engineers and specialists in various phases of accident-prevention would be invited as special speakers during the daily sessions, at the luncheons and dinner meeting. The safety engineers' companies were so strongly behind this educational venture that they agreed to absorb any air transportation costs between the islands and the personal expenses of the leaders if income from the training sessions did not meet total expenses. They offered the services of the industrial safety engineers completely free of any fees or honorariums.

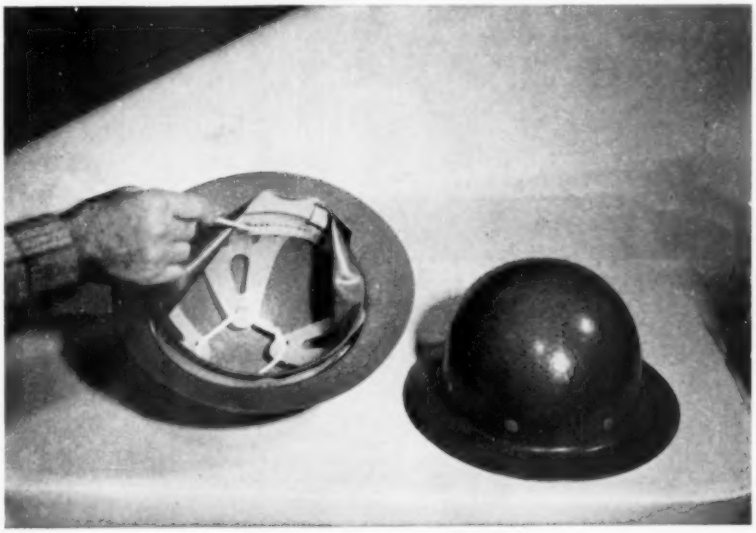
In this way the Hawaii Employers Council Industrial Safety Institutes were born. But there was the immediate question of whether industry would support this sort of training course. In addition to the increasing interest in safety as indicated by the steadily improving frequency rates, the Governor of Hawaii had sponsored a two-day Governor's Safety Conference. The large and representative attendance served to indicate that industry was strongly interested in these matters.

Also, 1956 was to include a meeting of the Territorial Legislature and already there were rumors of legislators' interest in increased Workmen's Compensation benefits. This, too, it was believed, should serve to increase participation in a well-conducted safety training course.

So plans immediately went forward. The safety engineers had developed a well-rounded, basic program with such subjects as: Why Safety? Safety Responsibility. Accident Causes. Safety Organizations and Programs. Housekeeping. Materials Handling. Basic Principles of Machine Guarding. Common Explosion Hazards. Fire Prevention, electrical hazards, occupational diseases, office safety and personal protective equipment. Arrangements were made for adequate locations in which to hold the institutes on each island. Dates were set. Publicity and invitations were mailed out.

We wanted as many people as possible to benefit from these institutes, yet we also recognize that adequate opportunity for discussion was almost mandatory. Balancing these two requirements, the maximum registration for each class was set at 35 people.

After planning our budget, a fee of $35 was set for each regis-



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trant. This low a fee was possible only because the services of the safety engineer leaders were furnished without charge. Included in this registration fee was a binder for each registrant with complete outlines of every subject covered, lunch each day of the course, a get-acquainted cocktail party and dinner the first evening of the week, a small library of carefully selected accident prevention bulletins and booklets, most of which were obtained from the National Safety Council, National Board of Fire Underwriters, government agencies and similar organizations. A special graduation luncheon topped off the course, with each registrant receiving a framed hand-lettered certificate.

The get-acquainted party and the registrants' opportunity to lunch together each day were big factors in the effectiveness of the course. Those who attended had not only the daily opportunity of discussing their own safety problems and experiences with each other and with the safety engineers who presented the subjects, but could also rub elbows and get the thinking of top management men who were invited to speak at certain of the luncheons and at the get-acquainted dinner.

Other features of the week's program were a fire-fighting demonstration and the use of many visual aids. Large charts covered the points of each subject discussed. Also motion pictures, sound film-strips and 35 mm. color-slide programs developed by local safety engineers brought emphasis and better understanding of the major areas studied. Through the cooperation of local suppliers, displays of personal protective equipment were an educational and constant reminder to participants through the entire week of each course.

The morning of the final day was devoted to a safety inspection tour by the group through a lumber mill, cannery, shop or similar operation. Pads and pencils were kept busy as good and poor accident prevention points were noted by registrants. Upon the group's return to the classroom, the notes were discussed. The safety engineers sat as a panel to comment, answer questions and highlight important reactions and suggestions of the group members.

During the months when the Institutes were being held, the Territorial Legislature met and did take action, as was expected, on Workmen's Compensation benefits. With the amended law came increases in weekly payments to $50 for disability and death, increases in the amount of compensation that can be paid to $20,000, a shortening of the waiting period from five days to two days and a number of other changes. On past experience it was estimated that costs would increase over 20 per cent as a result of these amendments.

A comparison of the Hawaii law with state laws as of August 1954 shows that only two states with maximum benefits have higher maximums than Hawaii; only two states have higher weekly payments; only one state has a shorter waiting period.

The Industrial Safety Institutes

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held during 1956 turned out to be one of the most succesful training courses ever held by the Hawaii Employers Council. More than 150 management and non-management people attended the sessions on the various islands. Without exception, the registrants and their companies were enthusiastic about the Institutes. They want more of them, so more will be held in the fall of 1956.

The first five months of 1956 show that four of our major sugar plantations, with a total of over 2,000,000 man-hours worked, have had no disabling injuries. We like to think that the Industrial Safety Institutes, another cooperative venture in Hawaii, has had something to do with it.

Facilities for Rail Employees

NEW REGULATIONS covering sanitation and shelter facilities for approximately 125,000 railroad, pullman and express company employees in New York state have been adopted by the Board of Standards and Appeals and become effective September 1, William S. Maxwell, chairman of the Board has announced. The regulations are embodied in the new Industrial Code Rule No. 42.

Enforcement of these regulations, like other Industrial Code rules, will be handled by the New York State Labor Department's safety service staff, according to Industrial Commissioner Isador Lubin, head of the New York State Labor Department.

Commissioner Lubin pointed out that Governor Harriman had signed a law in 1955, expressly authorizing it, in response to long-standing requests by railway labor for such regulation.

Subsequently Commissioner Lubin appointed a 22-man advisory committee to prepare a draft which furnished the basis for the final code as developed by the Board after public hearings.

"Heretofore, unions and management have bargained collectively regarding facilities for sanitation and shelter and the resulting agreement, when reached, generally applied only in a particular locality," said Commissioner Lubin. "The new code rule will take problems of sanitation and shelter out of the realm of collective bargaining.

"Washroom and toilet facilities, lockers or acceptable checking facilities for uniforms and sanitary places to eat are to be provided for all employees. Showers are to be provided where the type of work is such as to require them and standard dressing room accommodations are required for female employees.

"The regulations also require that such facilities as bunk rooms, dormitories or other acceptable sleeping accommodations be provided or made available to employees who are on duty and away from their families overnight.

"The type and quantity of facilities vary with the location where they are needed, with railroad yards, repair shops, main line track and freight piers all to be taken care of, as well as more usual locations, such as stations and terminals."

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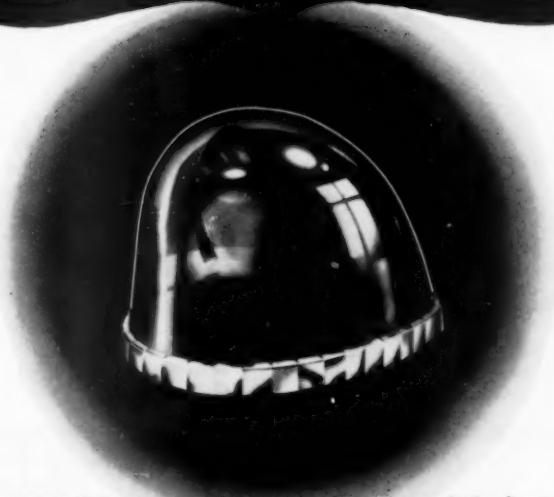

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Calendar Contest Winners For June 1956

First prize of $100 in the National Safety Council's Safety Calendar Contest goes this month to Reginald Geiser of Kansas City, Mo. The theme in this contest was take time to teach others. Mr. Geiser's line was adjudged the best of all those submitted. It was:

"Don't Trigger It—Figure It."

Second prize of $50.00 went to Allan D. Davis of Creighton, Pennsylvania, for this line:

"Don't Be Baited Into Carelessness!"

Third prize of $25.00 was awarded to Ernest Case, of Akron, Ohio, for the following line:

"Listen to the experienced. You could die getting your own."

Thirty $5.00 awards were issued to:

Charles W. Gierzak, superintendent, Pyrofax Gas Corp., Union Carbide & Carbon Corp., New York.

Robert Kershaw, tester, Consolidated Edison Co., New York.

Mrs. James Dilks, Reynolds Metals Co., Troutdale, Ore.

Mrs. Vera L. Pelton, United Air Lines, Seattle-Tacoma Airport, Seattle, Wash.

Mrs. L. B. Thompson, Jersey Central Power & Light Co., Point Pleasant, N. J.

A. D. Howard, Kaiser Aluminum Co., Newark, Ohio.

Donovan M. Hall, "A" class operator, E. I. Du Pont Benger Laboratory, Waynesboro, Va.

Mrs. Paul F. Covington, Ashland, Ore. (Individual Member)

S. J. Di Domenico, clerk, Pittsburgh Post Office, Pittsburgh, Pa.

Ray E. Peterson, editor, State Education Department, Denver, Col.

A/2c Paul A. Marinelli, message clerk, Hdq. 3rd Air Force, New York.

L. C. Bacon, electrician, Hercules Powder Co., Bessemer, Ala.

Austin Mellott, chief deliveryman, Sinclair Pipeline Co., Cleveland, Ohio.

—To page 131

Board Votes Increase

—*From page 10*

there be a single price list for members and non-members, but that a suitable discount be made to members.

"The staff has made the further analysis requested by the Board, and herewith presents proposed implementing actions in connection with each of the Committee recommendations. In arriving at these proposals it was assumed that the primary objective should be to obtain the widest possible distribution of Council materials consistent with sound financial operation. Achievement of this major objective, it was felt, would be in terms of the following specific aims:

1. Retain present members.
2. Attract new members.
3. Expand material sales to members.
4. Develop the very large potential market among non-members.

"It was apparent, in making the analysis, that each of various alternative plans would promote some of these aims better than others. The staff, therefore, in arriving at its final recommendations, as set forth below, attempted to arrive at the best possible balance. While the actions proposed may not be the best possible for achieving any *one* of the aims listed above, it is felt that they are the most likely to bring about *balanced progress* toward the major objective.

First Recommendation. That dues be increased and service credit be reduced.

"*Increase in Dues.* Staff analysis is in accord with the recommendation that dues be increased. Studies indicate that costs of Council operation have increased from 15 to 20 per cent since the last increase in dues, early in 1951. The increases now proposed generally amount to 15 per cent, although there are some variations. For industrial dues, two new brackets have been added for larger companies.

"*Reduction of Service Credit.* All members receive certain publications and materials as a part of their membership. The value of these specific materials returned to members is described as their service credit. For members

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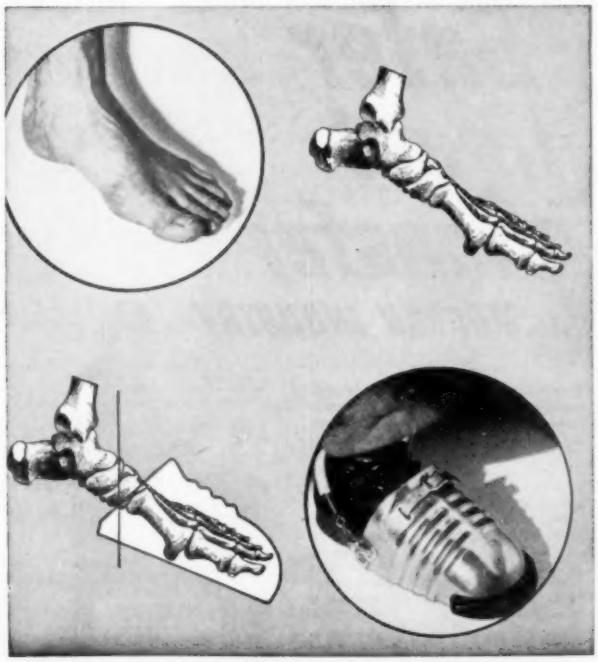

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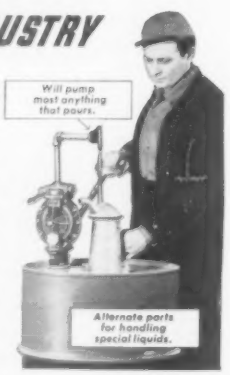

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who choose optional service, the service credit is exactly 65 per cent of dues. For other members, there is some variation, although the aim is to maintain the value of such service at about 65 per cent.

"After careful analysis it is the judgment of the staff that a reduction in the amount of the service credit, if made effective at the same time as an increase in dues and prices, would be questionable from the point of view of retaining the good will of present members and might tend to increase cancellations and make the securing of new members more difficult. It would seem unwise to increase a member's dues and at the same time *reduce* the services he is getting.

"It is the staff judgment that the service credit arrangements *should not be changed at this time.*

Second Recommendation. That prices of materials be raised.

"Staff analysis is in accord with the recommendation that prices should be raised. As indicated above, studies indicate that production costs have increased from 15 to 20 per cent since the last general price increase in 1951. It is the staff judgment, furthermore, that an average price increase of more than 15 per cent would not be attractive to the non-member market. It is recommended, therefore, that a new price list be developed, aimed at producing an over-all increase of 15 per cent. It is proposed that this be done on a selective basis, meaning that some items will be increased more than 15 per cent and some less, depending on production costs, purpose for which produced, and market conditions generally.

Third Recommendation. That there be a single price list for members and non-members, but that a suitable discount be made to members.

"Staff analysis is in accord with this recommendation. As indicated under the Second Recommendation, the proposal is that the new price list average 15 per cent above present prices. With the issuance of such a revised

price list, it is then proposed that Council members be given a discount of 10 per cent.

"This proposal represents a very substantial change in price policy for non-members, who now are required to pay twice the member prices. The present arrangement has meant, in effect, negligible sales to non-members. The new arrangement, it is believed, will open wide the non-member market, and will also increase membership as the non-member customer finds out what the Council is and does.

"As for members, they will, under the new arrangement, be paying prices only 3.5 per cent higher than at present. It is considered possible to hold the increase to such a low percentage, as compared with an estimated cost increase of 15 per cent, only because of the increased revenue from dues, and from the anticipated substantial volume of non-member sales which will be developed under this new policy.

"In connection with the single price list proposal, there is an important corollary recommendation, namely, that all present restrictions on purchase and redistribution of Council materials be lifted, with the single *exception* that *individual* members would not be allowed to purchase quantities of employee material at a discount. Otherwise, complete freedom would be allowed all members to purchase and redistribute, so long as there was no conflict with Council purposes and objectives.

"In the event of approval of this proposal, some weeks will be required to prepare the new single price list and to develop administrative procedures for effectuating the member discount. In the meantime there are some immediate sales possibilities which could be realized by authorizing use of the existing Government price list for non-members. Also, it would be advantageous to make effective at once the lifting of existing restrictions on redistribution of Council materials. Immediate action is proposed on these matters."

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—*From page 54*

Glyptal Insulation & Met Materials, New York; Chemical Prod. Works, Cleveland, Ohio; Mahoning Glass Works, Niles, Ohio.

General Engineering Works, Chicago.

General Foods Corp., Walter Baker & Co. Inc., Massachusetts.

General Refractories Co., Baltimore, Md.

General Shoe Corp., Three awards: Alabama Shoe Corp., Huntsville, Ala.; Leather Shoe Manufacturing, Atlanta, Ga.; Carrollton, Ga.; Lewisburg, Tenn.

Hamilton Manufacturing Corp., Plant Two, Columbus, Ind.

Hammel Dahl Co., Warwick, Providence, R. I.

Hanna Engineering Works, Chicago.

Harbison Walker Refractories Co., Bessemer (Ala.) Works.

Hawaiian Commercial & Sugar Co., Hawaii.

H. J. Heinz Co., Berkeley, Calif.

Edward Hines Lumber Co., Two awards: Saw Mill & Manufacturing; Plywood, Westfir, Ore.

Holly Sugar Corp., Delta, Colo.

Humphreys Gold Corp., Starke, Fla.

International Business Machine Corp., Plant Two, Poughkeepsie.

International Harvester Co., Richmond, Ind.

International Silver Co., Two awards: Factory "H," Meriden, Conn.; Factory "L," Wallingford, Conn.

Jones & Laughlin Steel Corp., Aliquippa Works; Toledo (Ohio) Container Div.; Electric Weld Tube Div., Pennsylvania.

Kimberly Clark Corp., Kimberly Mill, Wisconsin.

Kingsport Press Inc., Kingsport, Tenn.

E. J. Lavino & Co., Plymouth Meeting Plant, Norristown, Pa.

Lever Bros. Co., Cambridge, Mass.

Eli Lilly & Co., Indianapolis, Ind.

Lord Baltimore Press, Baltimore, Md.

Mead Corp., Two awards: Book & Cover Paper, Paper Board, Chillicothe, Ohio.

Missouri Pacific Railroad Co., Two awards: Central Div.;

Southern Kansas Div.

Monarch Cement Co., Humboldt, Kans.

Montgomery Ward & Co., Two awards: Region Retail Stores, Chicago; Wardway Paint Works, Chicago Heights, Ill.

Mt. Vernon Woodberry Mills Inc., Tallassee (Ala.) Mills.

National Biscuit Co., Five awards: Holland, Mich.; Buffalo, N. Y.; Dayton, Ohio; Biscuit & Cracker Manufacturing, Pittsburgh, Pa.; Houston, Tex.

National Carbon Co., Div. of U. C. C. Corp., Warehouse, Jersey City.

National Co. Inc., Malden, Mass.

National Distillers Products Corp., Hill & Hill Plant, Kentucky.

National Electric Products Corp., Ambridge, Pa.

National Gypsum Co., Mine Bellefonte, Pennsylvania.

National Vulcanized Fiber Co., Yorklyn, Del.

J. Neils Lumber Co., Logging Dept., Libby, Mont.

North American Cement Corp., Security Plant, Hagerstown, Md.

Oronite Chemical Co., Oak Point Plant, Gretna, La.

Owens Illinois Glass Co., Six awards: Manufacturing Glass Seven, Alton, Ill.; Manufacturing Glass 12, Gas City, Ind.; AM Struc. Prod. Co., Muncie, Ind.; Kimble Glass Div., Warsaw, Ind.; Vineland, N. J.; Manufacturing Glass Three, Fairmont, W. Va.

Pan Am Southern Corp., Destreham Refinery, Louisiana.

Philippine Air Lines Inc., Manila, Philippines.

Pickands Mather & Co., Five awards: Corsical Mine, Corsica Iron Co.; Embarass Mine Lake Mining Co.; Mohoning Mine, Mahoning Ore & Steel Co.; Sagamore Mine, Sagamore Ore Mining Co.; Erie Mining Co., Hibbing, Minn.

Pillsbury Mills Inc., Two awards: Pillsbury Mills, Clinton, Iowa; Globe Mills, Astoria, Ore.

Pittsburgh Consolidation Coal Co., Hanna Coal Co., Georgetown Mine.

Price Brothers & Co. Ltd., Riverbend, Que., Canada.

Procter & Gamble Co., Four awards: Chicago; Staten Island,

—*To page 118*

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Radio Corp. of America, Six awards: Tube Dept., Marion (Ind.) Plant; Monticello (Ind.) Plant; Camden, N. J.; Cincinnati (Ohio) Plant; Canonsburg (Pa.) Plant; Lancaster, Pa.

Ralston Purina Co., Feed Manufacturing, Minneapolis, Minn.

Republic Steel Corp., Four awards: Truscon Canton (Ohio) Screen Div.; Truscon Steel Co., Cleveland, Ohio; Niles (Ohio) Steel Prod. Div.; Truscon Steel Co., Youngstown, Ohio.

Reynolds Metals Co., Four awards: Richmond Radiator Co., New Castle, Del.; McCook, Ill.; Plant 14, Louisville, Ky.; North Plant, Richmond, Va.

Rohr Aircraft Corp., Chula Vista, Calif.

St. Regis Paper Co., Bucksport, Maine.

Sherwin Williams Co., Cleveland, Ohio.

Simpson Paper Co., Everett, Wash.

Smith Douglass Co. Inc., Phosphate Mining Tenoroc, Lakeland, Fla.

Sohio Petroleum Exploration Div., Production Dept.

Southern Pacific Co., Rio Grande Div.; Sacramento General Shops.

Standard Lime & Cement Co., Woodville, Ohio.

Standard Oil Co., Toledo (Ohio) Refinery.

Stauffer Chemical Co., Vernon Plant, California.

John Strange Paper Co., Menasha, Wis.

Sylvania Electric Products Corp., Three awards: Radio Tube Plant, Altoona; Huntington; Starter Plant, Missouri.

Talon Inc., Plant Six, Cleveland, Ga.

Tennessee Valley Authority, Three awards: Colbert County, Ala.; Widows Creek, Ala.; Gallatin Steam Plant.

Texas State Highway Dept., Austin, Tex.

Tidewater Construction Corp., Norfolk, Va.

U. C. C. Corp., 15 awards: Linde Air Products Co., Chicago Warehouse; Carbide & Carbon Chemical Co., Leach, Ky.; Carbide Power Co., Sault St. Marie, Mich.; National Carbon Co.,

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Union Bag & Paper Corp., Two awards: Paper Manufacturing, Savannah, Ga.; Woodland Div., New York, N. Y.

United Concrete Pipe Corp., Baldwin Park, Calif.

U. S. Army, Corps of Engineers, Two awards: Printing & Publishing, Virginia; Dam Construction, Gravelly Point, Va.

United States Gypsum Co., East Chicago (Ind.) Plant.

U. S. S. Co., 10 awards: U. S. Steel Products Co., Los Angeles; Consolidated Western Steel Corp., Vernon, Calif.; Michigan Limestone & Chemical Co., Calcite Plant, Mich.; Oliver Iron Mining Div., Sherman Mine, Fraser, Minn.; Oliver Iron Mining Div., Soudan (Minn.) Mine; Universal Atlas Cement Co., New York, N. Y.; Michigan Limestone Div., Annandale Plant, Pennsylvania; National Tube Co., Ellwood (Pa.) Works; Michigan Limestone & Chemical Co., Hillsville Quarry, Pa.; Carnegie Illinois Steel Corp., Imperial Works, Pennsylvania.

Victor Chemical Works, Silver Bow, Mont.

S. K. Wellman Co., Bedford, Ohio.

Weyerhaeuser Timber Co., Saw Mill, Springfield, Ore.

White Motor Co., Cleveland, Ohio.

Yale & Towne Manufacturing Co., Philadelphia Div.

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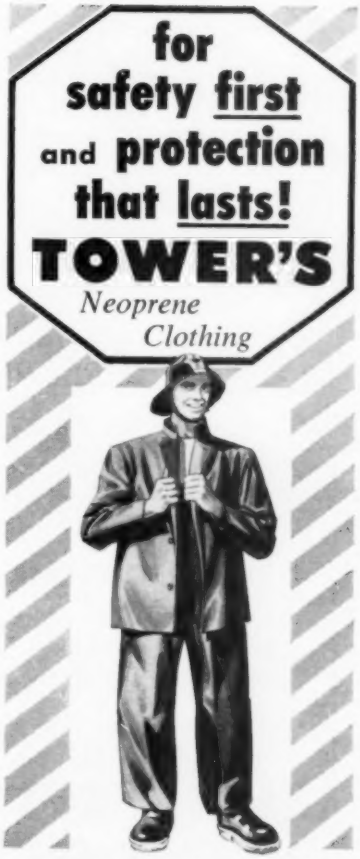
Allegheny Ludlum Steel Corp., Carmet Div., Ferndale, Mich.

American Can Co., Seven awards: Pacific Technical Service, San Francisco; Plymouth, Fla.; Illi-



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American Potash & Chemical Corp., Eston Chemical Div., Cal.

American Rock Wool Corp., Wabash (Ind.) Plant.

American Tobacco Co., New Port (Va.) New Leaf Dept.

J. E. Baker Co., Three awards: Billmeyer Plant, Bainbridge, Pa.; York (Pa.) Plant; Inwood (W. Va.) Plant.

Bayuk Cigars Inc., Leaf Plant, Lancaster, Pa.

Bessemer Limestone & Cement Co., Youngstown, Ohio.

Borden Co., Two awards: Anniston (Ala.) Ice Cream Distribution; Bradenton (Fla.) Ice Cream Distribution.

Buckeye Cellulose Corp., Four awards: Augusta (Ga.) Mill; Raleigh (N. C.) Mill; Evadale Plant; Traders Oil Mill Co., Fort Worth, Tex.

Cabot Carbon Co., Five awards: Kermit (Tex.) Plant; Kermit (Tex.) Walton Plant; Research & Development, Pampa, Tex.; Schafer "B" Plant, Pampa, Tex.; Estes Plant, Wickett, Tex.

Canadian Gypsum Co. Ltd., Hillsborough, Canada.

Celanese Corp. of America, Two awards: Belvidere (N. J.) Plastics; Clarkwood (Tex.) Chemical Laboratory.

Certain-Teed Product Western Gypsum Co., Building Materials, Sigurd, Utah.

Dow Chemical Co., Seal Beach, Calif.

E. I. Du Pont De Nemours & Co., 21 awards: Belin Works; Carothers Technical Lab., Delaware; Dacron Research Laboratory; Edge Motor Works, Delaware; Henry Clay (Del.) Exp. Station; Haskell Laboratory,

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Thomas A. Edison Inc., Silver Lake, N. J.

Firestone Tire & Rubber Co., Five awards: Laboratory Research & Pilot Plant; Woodstock, Ont., Canada; New Castle, Ind.; Akron (Ohio) Retread Shop; Reclaim Rubber Plant, Memphis.

Flinkote Co., Mount Carmel, Ill.

Funkhouser Co., Delta, Pa.

General Cigar Co., Lancaster (Pa.) Chester Branch.

General Electric Co., Five awards: Andover (Ohio) Bulb Works; Base Machine Works, Cleveland; Nela Press, Nela Park, Cleveland; Jefferson (Ohio) Welding Works; Bridgeville (Pa.) Glass Works.

General Shoe Corp., Nashville, Tenn.

Harrison Walker Refractories Co., Three awards: Gasconade Mine; Cuivre Mine, Vandalia, Mo.; Hays Laboratory, Pa.

H. J. Heinz Co., Salem, N. J.

Humphrey's Gold Corp., Two awards: Highland Plant, Lawtey, Fla.; Starke, Fla.

International Silver Co., Two awards: Factory "S S," Connecticut; Meriden (Conn.) Factory "D."

Jahncke Service Inc., Two awards: Feliciana Eastern Railroad, Buff Creek, La.; Flint Sand & Gravel Co., Buff Creek, La.

Jones & Laughlin Steel Corp., Seven awards: New Orleans Container Div.; New Orleans Warehouse; Bayonne (N. J.) Container Div.; Union Dock Co., Ohio; Philadelphia Container Div.; Floreffe (Pa.) Ma-

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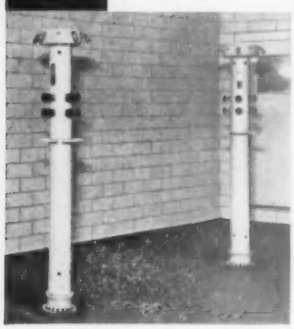

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Land-O-Lakes Creameries Inc., Sales Group.

Lever Brothers Co., Pepsodent Div., Chicago.

Material Service Corp., Lockport (Ill.) Machine Shop.

McColl Frontenac Oil Co. Ltd., Two awards: Edmonton Works; Toronto Terminal.

M.F.A. Plant Foods Div., Joplin (Mo.) Plant.

Monsanto Chemical Co., Anniston (Ala.) Plant "D."

National Biscuit Co., Five awards: Los Angeles; Battle Creek; Bread & Cake, Plattsburg, N. Y.; Rochester; Potato Chip Manufacturing, York, Pa.

National Distillers Chemical Co., Two awards: Huntsville, Ala.; U. S. Indiana Chemical Co., Tuscola, Ill.

National Distillers Products Corp., Seven awards: Bellows Plant, Louisville; Blending & Spirits, Ohio; John Dekuyper & Son Inc.; W & A Gilbey Ltd., Ohio; Loretto Distributors, Loretto; Old Taylor, Frankfort; Sunny Brook Distributors, Kentucky.

National Gypsum Co., Three awards; Matteson, Ill.; Good Hope, La.; Garwood, N. J.

New York Wire Cloth Co., Two awards: Durall; Wire Mill.

Owens-Illinois Glass Co., Four awards: Central Mold Shop, Oakland, Calif.; Pacific Grove, California Plant 91; Office 21, San Francisco; Warehouse Terre Haute (Ind.) Plant 25.

P & C Hand Forged Tool Co., Portland, Ore.

Peter Paul Inc., Philadelphia Div.

Pickands Mather & Co., Three awards: Albany Mine, Crete Mining Co.; Erie Commercial, Erie Mining Co.; Erie Laboratory, Erie Mining Co.

Pillsbury Mills Inc., Two awards: Nashville, Tenn.; Wellsburgh, W. Va.

Pittsburgh & Midway Coal Min-

ing Co., Hopkins County, Ky.

Price Brothers & Co. Ltd., Kenogami, Que., Canada.

Procter & Gamble Co., Three awards: Macon, Ga.; Quincy, Mass.; Portsmouth, Va.

Ralston Purina Co., Six awards: Feed Manufacturing, Smithville, Ont., Canada; Wichita, Kans.; Products Manufacturing, St. Louis, Mo.; Jackson, Miss.; Feed Manufacturing, Omaha, Neb.; Amarillo, Tex.

Rathborne Hair & Ridgeway Co., Jackson, Ala.

Republic Steel Corp., Four awards: Union Drawn Steel Div., Los Angeles; Hartford Plant; Detroit Plant, Ferndale, Mich.; Ideal Foundry Div., Newton Falls, Ohio.

Reynolds Metals Co., Vernon, Calif.

F. S. Royster Guano Co., Three awards: Bessemer (Ala.) Plant; Macon (Ga.) Plant; Jackson (Miss.) Plant.

Joseph E. Seagram & Sons Inc., Milan, Ind.

Sherwin Williams Co., Cleveland, Ohio.

Sinclair Pipe Line Co., Two awards: Quincy District, Quincy, Ill.; Mechanicsburg District, Pennsylvania.

Smith Douglass Co. Inc., Two awards: Smith Rowland Co., Selbyville, Del.; Albert Lea, Minn.

Spencer Kellogg & Sons Inc., Chicago.

Standard Lime & Cement Co., Four awards: La Grange, Ill.; Bellefonte, Pa.; Knoxville, Tenn.; Kimballton, Va.

Standard Oil Co. of Ohio, Marine Div., Transportation Dept.

Stauffer Chemical Co., Five awards: Montrose Chemical Corp. of California; Richmond Research Laboratory, California; Boric Acid Plant, San Francisco; North Portland Plant; Dominque Plant.

Sylvania Electric Products Inc., Five awards: Houtzdale, Pa.; Mechanical Development Plant, Pennsylvania; Montoursville, Pa.; Lamp Plant, St. Marys, Pa.; Wheeling (Va.) Fixture Plant.

Talon Inc., Plant One, Woodland, N. C.

Tennessee Eastman Co., Acid Div., Kingsport, Tenn.

U. C. C. Corp., 26 awards: Linde Air Products Co., Mobile (Ala.) Combination Plant; Union Carbide Nuclear Co., Mining Department, Colorado; Linde Air Products Co., Denver (Colo.) Acetylene Plant; Savannah (Ga.) Oxygen Plant; Flame Plating Production, Indiana; Wichita (Kan.) Oxygen Plant; New Orleans Ox-Baton Rouge Fill; Baltimore (Md.) Oxygen Plant; Grand Rapids Oxygen Plant; Duluth (Minn.) Acetylene Plant; St. Louis (Mo.) Acetylene Plant; East Buffalo Ox-Plant & Niagara Falls; Charlotte Combination Plant; Ashtabula (Ohio) Oxygen Plant; Cincinnati (Ohio) Oxygen Plant; Allentown (Pa.) Combination Plant; Altoona (Pa.) Combination Plant; Duquesne Plant, Fairmont Warehouse; Erie (Pa.) Oxygen Plant; Essington (Pa.) Oxygen Plant; Harrisburg (Pa.) Combination Plant; Pittsburgh (Pa.) Combination Plant; Salt Lake Ox-Plant & Pocatello Fill St.; South Charleston Acetylene Plant; Carbide & Carbon Chemical

SURETY GRIPTITE
ROUGH FINISH COATED FABRIC WORK GLOVES

RESISTANT TO OILS, ACIDS, CHEMICALS, CUTTING, SNAGGING, ABRASION

NO SIDE SEAMS OR THUMB SEAM TO RIP OR OR WEAR OUT

Now, A POSITIVE GRIP

IN OIL, GREASE, GASOLINE, ACIDS AND SOLVENTS

Combining a vinyl base with a Sureseal rough finish, Surety Griptites achieve the qualities for long life and a claw-like grip. Here's comfort, service and safety that keep glove costs reasonable. Send for bulletin.

THE SURETY RUBBER COMPANY
Carrollton, Ohio
In Canada:
Safety Supply Co., Toronto

DOUBLE DUTY SAFETY BULLETINS THAT HELP CHECK ACCIDENTS

WRITE FOR NEW SAFETY SIGN CATALOG

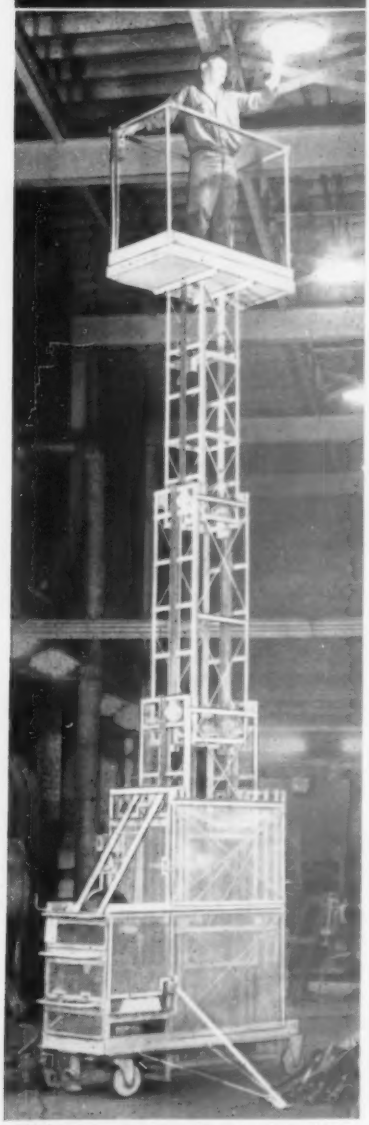
Prairie State Products Co.

3822 LAWRENCE AVE. CHICAGO 25, ILL.

THE MAN WHO FEELS SAFE WORKS BETTER

Economy HI-REACH TELESCOPER

ENGINEERED FOR STRENGTH STABILITY AND SAFETY



Safety is our first consideration in building Hi-Reach Telescopers.

During the past quarter of a century of making Hi-Reach Platform Telescopers, our engineers have constantly improved the mechanical construction to obtain maximum stability, smooth time-saving lifting action, and safety.

Standard Models available from 10'-9" to 35 ft. high, and custom-built units as high as 100 ft. if you like.

ECONOMY ENGINEERING CO. EST. 1901
4518 W. Lake St., Chicago 24, Ill.

Co., Diamond, W. Va.; Casper (Wyo.) Combination Plant.

United States Forest Service.

United States Gypsum Co., Manufacturing Plaster & Wallboard, Sigurd, Utah.

United States Printing & Lithograph Co., Erie (Pa.) Div.

University of Akron, Government Laboratories, Akron, Ohio.

U. S. S. Co., Five awards: Oliver Iron Mining Div., Arcturus Mine, Coleraine, Minn.; Crushing Plant, Mt. Iron, Minn.; Concentrating Plant, Mt. Iron, Minn.; Pilotac Open Pit Mine, Minnesota; Plummer Open Pit Mine, Taconite, Minn.

Victor Chemical Works, Tarpon Springs, Fla.

Woodward Iron Co., Misc., Woodward, Ala.

CORRECTION

Among the winners of Certificates of Commendation listed in the June NEWS was Dominion Tar and Chemical Company, Limited, Beauharnois, Que. The correct name for this plant is Standard Chemical Company, Limited, Beauharnois Plant, Division of Columbia Southern Chemical Company.

Organize Safety on Company-Wide Basis

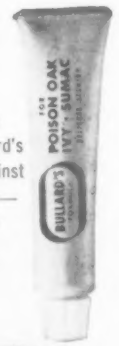
W. R. GRACE & Co., a 102-year old concern with diversified industrial operations in the United States, Latin America, Canada, Europe and Australia, has inaugurated its first company-wide safety campaign designed to coordinate safety activities previously carried on independently by divisions and subsidiaries.

Felix E. Larkin, vice-president in charge of industrial relations has named A. B. Pettit as director of industrial health and safety. Mr. Pettit was formerly health and safety administrator for the company's Davison Chemical Company Division which has been awarded five National Safety Council awards of honor in the last six years under his guidance.

An industrial safety expert of broad experience, Mr. Pettit has frequently been called upon to participate in the investigation of many serious accidents, fires and explosions.

BULLARD'S FORMULA
QUICK RELIEF • POISON IVY
POISON OAK • SUMAC

Odorless, greaseless and safe to use even around the eyes. Bullard's Formula provides protection against these plants and speeds healing—stops itching when applied after rash appears . . . Write for photographs of actual tests.
E. D. Bullard Company
San Francisco, California



plan now for this summertime hazard

EVERYTHING BULLARD IN SAFETY

GETS-A-LITE GUARD and GUIDE

Quickly and Easily Installed by Anyone — No Tools Needed!

- Simply slip GETS-A-LITE GUARD AND GUIDE over the fixture, as illustrated.
- Made of indestructible spring steel wire. Nothing to break, get out of order or replace. Will last indefinitely.
- Once installed, GETS-A-LITE GUARD AND GUIDE is NEVER removed.
- Nothing to unlock, fuss with or lock, when changing lamps.
- GETS-A-LITE GUARD AND GUIDE actually steers lamp into socket, enabling maintenance man to change lamp in 10 seconds!
- Available for 40 watt and 100 watt fluorescent lamps.

GETS-A-LITE CO. — Dept. NS-86
3865 N. Milwaukee Ave., Chicago 41, Ill.

For a More Successful Poster Program

POSTER program aids miniatured on this and the following pages are NEW — shown here for the first time. Those illustrated in one color are actually printed in two or more colors.

For maximum variety, refer to the 1956 Directory of Occupational Safety Posters. There you'll find 756 top-notch selections on a great variety of subjects.

Copies of the Directory are available at 50 cents each—write Membership Service, N.S.C.

JUMBO POSTER for OCTOBER 1956

The Jumbo poster, issued monthly, is designed for outdoor use and is available to members on annual subscription but is not stocked. Its actual size is 9' 11" by 11' 8".

SAFETY BANNER FOR OCTOBER, 1956

Here is the attention-getting, monthly cloth banner. Available in two types—indoor and outdoor—both are identical in size (10 feet long by 40 inches high), have the same general message and multi-color design. Indoor type is of sturdy drill with grommets for easy hanging, while the outdoor banner is of extra heavy drill, with wind vents, and has strong stitched-in rope for durability.

©NATIONAL SAFETY COUNCIL

0814-A 8½x11½

This new four color poster is illustrative of the 72 four color posters shown in the 1956 Poster Directory.

Electrotypes of poster miniatures on this page are not available, but can payroll inserts be supplied.

Posters below are printed in two or more colors

(Available only in sizes indicated)

©NATIONAL SAFETY COUNCIL

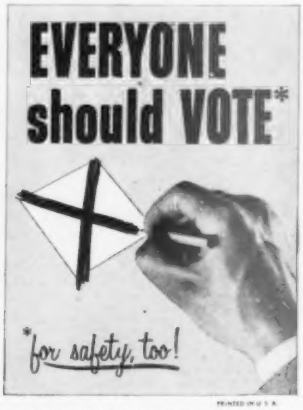
0851-C 25x38

©NATIONAL SAFETY COUNCIL

0807-B 17x23

©NATIONAL SAFETY COUNCIL

0716-A 8½x11½



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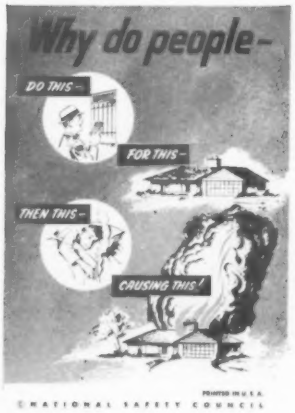
0793-A 8½x11½

NATIONAL SAFETY COUNCIL

0746-B 17x23



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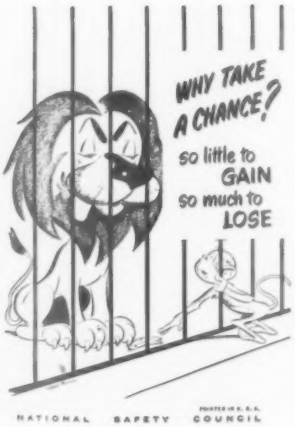
0794-B 17x23

©NATIONAL SAFETY COUNCIL

0834-B 17x23



NATIONAL SAFETY COUNCIL

0592-A 8½x11½

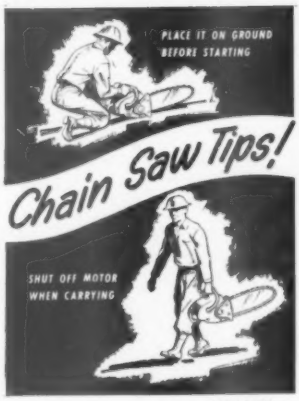
NATIONAL SAFETY COUNCIL

0677-B 17x23

Electrotypes of payroll inserts can be furnished in all poster illustrations shown above.

Posters below are printed in two or more colors

(Available only in sizes indicated)



©NATIONAL SAFETY COUNCIL

0855-A 8½x11½

NATIONAL SAFETY COUNCIL

0566-A 8½x11½

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0772-A 8½x11½

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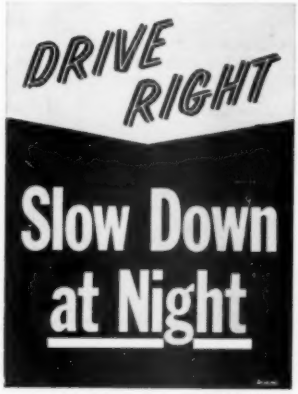
0770-A 8½x11½



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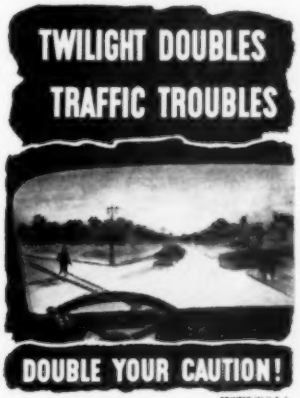
T-0783-C 25x38
T-0784-A 8½x11½



©NATIONAL SAFETY COUNCIL

V-0782-B 17x23

©NATIONAL SAFETY COUNCIL

V-0820-B 17x23

AVOID
RIGHT TURN ACCIDENTS
• Check to the rear
• Signal your intentions
• Slowly position vehicle near curb
• Wait for traffic to clear
• Proceed with caution

©NATIONAL SAFETY COUNCIL

V-0822-B 17x23

©NATIONAL SAFETY COUNCIL

V-0821-A 8½x11½

Electrotypes of payroll inserts can be furnished in all poster illustrations shown above.

Consultation Corner

—*From page 12*

should be securely lashed at the top, and this means the man is going to have to go up the ladder in order to tie it. Therefore, erecting a ladder in a strong wind requires at least two and preferably three men.

An extension ladder should be raised in collapsed position by one man while the other two men either hold it securely or hold tag lines to the sides to prevent it from moving sideways. Once it is in a vertical position, and while still being held securely, the third man should then extend it by means of the pulley line. The other two men should then hold it securely while the third man goes up and lashes it.

If circumstances do not permit lashing, the other two men, or at least one man, should be stationed to hold the ladder. Alternatively, the tag lines could be brought out to the sides and down, and then be secured.

Precautions of this kind would eliminate most of the hazards for the man working on the ladder, because the ladder itself could not move, and if he held on and did not reach out too far there is no reason why he should be blown off. A short life line attached to a life belt worn by the worker and secured around one of the upper rungs of the ladder is an added safeguard.

So far as your question, "What constitutes a strong wind?" is concerned, we agree with you that it would be necessary to make a number of assumptions to arrive at any kind of a figure. In nautical terms, a force six (Beaufort scale) wind is called a strong breeze; in weather bureau forecast terms, this is a strong wind, from 25 to 31 land miles per hour. The effect ashore is "large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty."

However, just as an assumption, I should rather say that a force five or "fresh" wind 19 to 24 land miles per hour, would be the point at which trouble might be expected, in the use of a ladder. Here the description of the effect ashore is "small trees in leaf begin to sway; crested wavelets form on inland waters." This is the point at which a small sailing vessel would shorten sail. The terms and quotations are from Knight's *Modern Seamanship*.

Page 14-10 of the *Accident Prevention Manual* contains a table of wind forces in which the de-

SAFETY FACTS for Industry

MOST SAFETY DIRECTORS INSIST ON Safe-Hi LADDER SHOES!

BECAUSE Safe-Hi LADDER SHOES ARE U/L APPROVED FOR ALL SURFACES! THIS EQUIPMENT ENABLES WORKERS TO PERFORM LADDER JOBS WITH SAFETY* AND EFFICIENCY—NO NEED OF "HELPER" TO HOLD BASE OF LADDER!

* A 1949 REPORT OF THE N.Y. WORKMEN'S COMPENSATION BD. SUMMARIZING 21,000 FALL ACCIDENTS, DISCLOSED SLIPPING LADDERS AS THE PRINCIPAL CAUSE OF LADDER ACCIDENTS.

DIAGRAM SHOWING ACTUAL HOLDING POWER OF Safe-Hi LADDER SHOES UNDER CONDITIONS INDICATED FROM AUTHENTIC MEASURED TESTS.

SELF SHARPENING SPIKE FOR ICE, SNOW, GRAVEL ETC.

ALSO AVAILABLE:—NON-SPARK! ADDER SHOES FOR REFINERIES, GRAIN ELEVATORS, MUNITIONS PLANTS AND ALL INDUSTRIES WHERE SPARKS ARE A HAZARD.

OTHER Safe-Hi LADDER ATTACHMENTS

POLE GRIP HOLDS TOP OF LADDER ON ANY POLE, PIPE OR CORNER.

WALL GRIP HOLDS TOP OF THE LADDER SECURELY ON ALL SMOOTH WALLS.

ROSE MANUFACTURING CO.
2700 W. BARBERRY PLACE
DENVER 4, COLORADO

Safe-Hi DENVER

NO-FOG

Lens Cleaning Tissues

Use Just Water, No Chemicals Needed

This new, chemically treated tissue is low in price and does away with expensive chemical sprays. Cleans and no-fogs goggles, eyeglasses and welding lenses with the addition of water only.

Tissues can be used several times.

Contact your nearest jobber or write us for samples and literature.

Distributors wanted. Write for proposition.

4 Boxes — 1000 Tissues Each	
Size 4½" x 10¾"	$7.00
Dispenser Bracket for tissue	75c ea.
Dispenser Bracket for water	65c ea.
Water bottle with Spray Pump	35c ea.

CARHOFF COMPANY
11706 Kinsman Ave. • Cleveland 20, Ohio

"Well, that convinces me—I'm giving up smoking!"

scriptions are different from those given above. On this scale, fresh winds as cited above would give wind pressures of from approximately 1.5 to 2.5 lbs. per sq. ft. on the ladder.

You mentioned in your calculation that on a newly-painted surface the ladder can begin to move in a wind between 22 and 30 mph. This seems logical in view of the above figures. It is quite evident that in such a wind, a ladder leaning against any surface should be secured. Actually, it is good practice to lash or otherwise secure all long, straight ladders if there is a possibility of slipping or moving from any cause. Incidentally, of course, such ladders should have proper safety feet to prevent slipping at the bottom.

Around the Compass

—*From page 8*

editorial said, "Over the years New York has incurred a debt of gratitude for important service in saving of human life and the reduction of human suffering by the Greater New York Safety Council. The Council has always operated on a modest budget, quite out of keeping with the breadth of its activities. New York spends less for safety per capita than any other major city in the country."

The editorial went on to point out the New York Safety Council has operated at a deficit the last two years and that an absurdly small amount of money for such a city is what was needed.

"The Greater New York Safety Council should be a cherished member of the family of good causes, not just a needy stepchild," the *Times* said.

Marine Safety Clinics

A series of navigation and safety clinics for mates and masters of Inland Vessels are being held by the Marine Division of the Metropolitan New Orleans Safety Council. The clinics are being conducted by Captain Samuel O. Larche (USCG ret.).

The Delta Society and the New Orleans Council are co-sponsoring the clinics, which are scheduled intermittently in various sections of the Metropolitan New Orleans area and in nearby Louisiana points. The clinics are designed to help control a rash of inland vessel accidents that have developed recently in the area.

Howard L. Willett Cited

Howard L. Willett, chairman of the board, Willett Company, and president, Willett Motor Coach Company, was recently awarded the alumni citation for useful citizen by the University of Chicago Alumni Associaton.

The Association holds that a university education should be the training and inspiration for unselfish and effective service to the community, the nation and humanity. They also believe that men and women, in accepting the privileges of a university education, assume also the obligation to society to exercise leadership in those civic, social and religious activities that are essential to a democracy.

In 1951, Mr. Willett campaigned for and started the Citizens Traffic Safety Board in Chicago. Helping to raise $150,000 annually, he

QUIET
FACTORY NOISE with
SONOSORBER*

GUARANTEED RESULTS! FREE ENGINEERING SURVEY, ANALYSIS and ESTIMATES. Write Today.

ELOF HANSSON, INC. ACOUSTICAL DEPT. NSB-6
711 THIRD AVENUE, NEW YORK 17, N. Y.

It costs you less than 25¢

. . . less than 25c worth of an employee's time to check . . . and make sure that his eyes are *working efficiently TOGETHER*, so that he is comfortable, efficient . . . and

his eyes are
SAFE

44% fewer accidents reported by plant managers after installing these visual checks. Other gains: 20% less spoilage, higher production, 45% saving in training costs.

No plant can afford workers with UNHAPPY EYES. Mail the coupon for details.

KEYSTONE VIEW CO., MEADVILLE, PA.
( ) SEND BOOKLET TELLING WHAT PLANTS ARE ACCOMPLISHING WITH VISION SCREENING.

(NAME) .....

(COMPANY) ..... (CITY) .....

NEW! EXCLUSIVE!

Hi-Dri with the NEW 3-IN-1 SPREADER-CART

USE IT ON YOUR FLOORS FOR
*SAVINGS IN ABSORBENT!
*SAVINGS IN LABOR!

Spreads HI-DRI evenly and 10 times faster

3-IN-1 OPERATION

1. for STORING Hi-Dri
2. for SPREADING Hi-Dri
3. for REMOVING Hi-Dri after it has "done the job"

"PERFECT TEAM"

Best of all ways to apply HI-DRI

Best of all Absorbents

At jobbers in principal cities or write to:

WAVERLY Petroleum Products Co.
1724 Chestnut St., Phila. 3, Pa.
Mine and Plant / Quality, Georgia

organized a staff that brought Chicago's safety record from last to first place (in cities of over one million) accumulating in 1955, four awards from the National Safety Council. At the moment the 1956 record is 20 per cent better than last year. In 1955, the Civican Club awarded Mr. Willett a plaque for outstanding service in traffic safety.

Forest Products Safety Conference

The 22nd annual Forest Products Safety Conference was held April 5th-7th in Klamath Falls, Ore., with more than 250 delegates representing approximately 150 firms from Pacific Northwest, Canada and Northern California in attendance.

Highlights of the program included panels on rehabilitation of injured and handicapped persons and the use of incentives in a safety program; the keynote address by Roy F. Morris, chairman of the Industrial Forestry Associations; a speech by Robert M. Evenden, safety manager of Guy F. Atkinson Co. and North Fir Lumber Company, San Francisco, and the showing of logging and saw mill safety slides and film.

Plant Safety Sessions

Five New Jersey conferences covering industrial accident and fire prevention were recently conducted by the Industrial Committee of the Mercer County Safety Council, with the cooperation of the American Society of Safety Engineers, Penn-Jersey Chapter. The weekly sessions held in Trenton, April 25-May 16th were open to industrial personnel from Mercer and Middlesex counties.

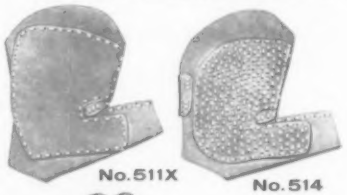
A demonstration of industrial fire-fighting equipment was held May 26 as part of the program. Certificates were awarded for those attending three sessions.

Bill: "I can't imagine what Joe does with his money. He was short yesterday and he is short again today."

Fred: "Is he trying to borrow from you?"

Bill: "No, I'm trying to borrow from him."

too rough to handle?



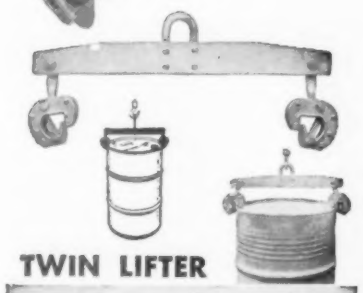
WHERE the material you work with is extremely abrasive, has barbs as sharp as razors — that's where you need Racine Wire-Stitched Gloves! Designed to give you complete hand protection under the most hazardous conditions. Racine Gloves also give you greater finger dexterity and durability.

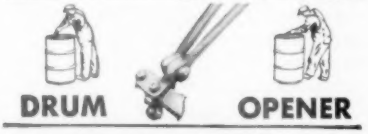
Your nearby Racine Glove distributor is stocked and ready to serve you. Order from him today

FREE JOB-TEST... send us in detail, a description of materials to be handled, temperature conditions and type of job operation. We will then recommend the correct gloves and send FREE samples for you to test.

Racine
GLOVE COMPANY, INC.
RIO, WISCONSIN
Safety Gloves and Apparel
FOR INDUSTRY

YOUR BEST MOVE . . . MOVE
with MERRILL
MATERIAL
HANDLING
DEVICES





For Interesting Information write

MERRILL BROTHERS

56-28 Arnold Ave., Maspeth, N. Y.

Calendar Contest

—From page 112

Jess Massingale, bookkeeper, Great States Corp., Shelbyville, Ind.

John E. Biddle, trucker, Cake Processing Dept., American Viscose Corp., Parkersburg, W. Va.

Harold Schaefer, lab janitor, Hercules Powder Co., Parlin, N. J.

Mrs. Arnold Adams, Milton, Mass.

Mrs. Max Levin, U. S. Post Office, Milwaukee.

Elizabeth J. Moore, stenographer, Carolina Power & Light Co., Asheville, N. C.

Arilita Wandling, San Luis Obispo, Calif.

Roy Hopkins, district manager, Lake Superior District Power Co., Ironwood, Mich.

Mrs. Edith Chandler, Oak Ridge National Laboratory, Union Carbide Nuclear Co., Oak Ridge, Tenn.

June Marchand, U. S. Rubber Co., Bristol, R. I.

Lolita E. Blood, weaver, Deltox Rug Co., Div. of The Armstrong Cork Co., Oshkosh, Wisc.

E. John Wilson, junior draughtsman, American Pulley Co., Philadelphia, Pa.

Robert E. Lee, field engineer, Republic Steel Co., Cleveland, Ohio.

E. T. Henry, tabulating equipment clerk, Union Carbide Nuclear Co., Oak Ridge, Tenn.

Mrs. Maxine Juday, S.P.C. clerk, U. S. Rubber Co., Mishawaka, Ind.

Margaret Avery, Customer Service Dispatch Dept., Southern California Gas Co., Los Angeles.

Edward Hughes, Employee Relations Dept., E. I. Du Pont De Nemours & Co., Inc., Gibbstown, N. J.

Pipe Dream!

"Be right down, Chief!"

What they can't see may hurt them

. . . so post your important safety notices on well-lighted

DIAMOND BULLETIN BOARDS

Your safety messages posted on Diamond Bulletin Boards will get across to employees because they will be readable any time—day or night, in any kind of weather. Diamond Bulletin Boards are illuminated, and ventilated to prevent fogging.

Their sturdy, all-metal construction assures years of good service, indoors and out. They are dust, weather and water proof. Metal straps provide a convenient method of hanging. The upson board used for mounting can also be used as a blackboard, if you want to write a notice directly on it.

Write for further information and prices on Diamond Bulletin Boards. They are available in both single and double units.

Ask for literature on our complete line of safety equipment.

SAFETY FIRST SUPPLY CO.
425 Magee Street • Pittsburgh 19, Pa.

"We've reduced our scrubbing time from 70 to 7 man-hours ... and our floors have never before been so clean!"

— says Foreman of
BURNY BROS. BAKERY, CHICAGO

Garage and stockroom floors in Burny Bros. large, modern bakery get daily scrubbing with a *Job-Fitted Combination Scrubber-Vac* and *Setol Cleanser*

THEY'RE an unbeatable team to speed the cleaning of oily, greasy floors. *Here's why:* A *Scrubber-Vac* completely mechanizes scrubbing. It applies the cleanser, scrubs, flushes if required, and picks up (damp-dries the floor) — *all in one operation! Job-fitted* to specific needs, a *Scrubber-Vac* provides the maximum brush coverage consistent with the area and arrangement of the floors. Its teammate, *Setol Cleanser*, is specially designed for the greater speed of *combination-machine-scrubbing* ... emulsifies grimy oil and grease *instantaneously* for fast, thorough removal by the machine's powerful vac. Moreover, *Setol* retains its strength longer than average alkaline cleansers. This, too, speeds the cleaning process ... saves on materials ... and cuts operating time of the machine, which in turn reduces labor costs. The *Scrubber-Vac* shown above is *Finnell's 213P*, for heavy duty scrubbing of large-area floors. It's *self-propelled*, and has a 26-inch brush spread. Cleans up to 8,750 sq. ft. per hour (and more in some cases), depending upon condition of the floors, congestion, et cetera. (The machine can be leased or purchased.) *Finnell* makes a full range of sizes, and *self-powered* as well as *electric* models ... also a full line of fast-acting cleansers. In fact, *Finnell makes everything for floor care!* Find out what *you* would save with *combination-machine-scrubbing*. For demonstration, consultation, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 2208 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

FINNELL SYSTEM, INC.
Originators of Power Scrubbing and Polishing Machines

Everything FINNELL for Floor Care

BRANCHES IN ALL PRINCIPAL CITIES

NEW SAFETY EQUIPMENT

Further information on these new products may be obtained by writing direct to the manufacturer or by circling the corresponding item number on the Reader Service Postcard.

Asbestos Fire Blanket

The Fite Rite asbestos fire blanket in its self-storing container has many applications for saving lives and protecting machinery from fire. The blanket is made from either 10 cut commercial grade woven asbestos cloth 2.25 lbs. per sq. yd. or 10 cut Underwriters' Grade 2.50 lbs. per sq. yd. A large top hem permits it to be hung on a rod as a curtain.

The portable container should be hung on a wall or post at points of greatest hazards. The unit can be used in conjunction with other mobile fire-fighting equipment. The container is finished in fire red, and is 9 in. in diameter and 19 in. long and made of 24-gauge steel.

Cotton Goods Manufacturing Co., 216 N. Clinton St., Chicago 6. (Item 1)

Radiation Survey Meter

Model 414 logarithmic radiation survey meter makes possible direct readings of x-ray, gamma and beta radiations over a full scale ranging from 3 to 3,000 milliroentgens per hour.

It is said to eliminate errors in scale selection and the need for switching scales. A large meter face with a specially designed scale gives extra visibility for easy reading.

A one-tube circuit provides reliable performance and accuracy of ± 20 per cent throughout the entire range.

It has a built-in internal current source for calibration, eliminating the need for radioactive sources to calibrate the unit for operation.

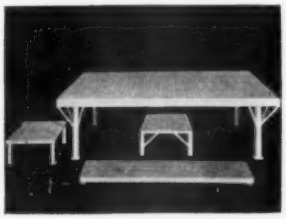
Battery life ranges from 1,000 hours for filament batteries to approximately 3,000 hours for the B+ battery and shelf life for chamber batteries.

The unit measures 3 in. x 6 in. and the ionization chamber is approximately 600 cc in volume. Dessicant cartridges of silica-gel are located in easily removed plastic domes for instant observation of condition.

Atomic Instrument Co., 84 Massachusetts Ave., Cambridge 39, Mass. (Item 2)

Safety Tread Products

A new series of heavy-duty, long-wearing, custom-made products featuring safety tread is available for industry. The new line includes safety-tread work platforms, stairs, dock boards and floor racks. In addition to providing safety work platforms of any desired shape, the new



products can be specified by exact height requirements, the precise type of safety grating desired, and the load limit which the structure must meet.

Illustrated are one large and two small work platforms, each showing a different type of construction, and a floor rack which is mounted on soft neoprene bumper blocks to cushion shock and reduce worker fatigue.

Bustin Steel Products, Inc., Dover, N. J. (Item 3)

Industrial Work Gloves

Butyl rubber work gloves are said to protect the hands from destructive acids. These gloves cannot absorb, and resist such agents as sulfuric, nitric and phosphoric acids, oxygen, ozone, oils, salts and many others. The glove is a one-fingered

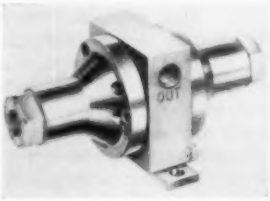
model, seam and crotch reinforced. It is light green and has a rough, stippled finish.

Hood Rubber Co., Industrial Glove Div., Watertown 72, Mass. (Item 4)

Power Equipment Safety Valves

A new N-T-D (non-tie-down) and a pair of pilot valves for presses, brakes, shears, and other machines provide two-hand safety. This is accomplished with the non-tie-down valve interposed between two palm button three-way valves in parallel and the receiver that is to be alternately pressurized and exhausted.

If the machine operator engages or disengages only one of the pair of palm button valves, the N-T-D valve will automatically shut off any subsequent air flow through itself to the receiver. Recocking of the



N-T-D valve for safe two-hand operation can then be accomplished only by releasing the engaged pilot valve. To permit a reasonable delay between engagement of one palm valve and the other, a tamper-proof integral adjustment is provided in the N-T-D valve.

The N-T-D double palm button

pilot circuit is applicable to most air-operated single stroking machinery.

Ross Operating Valve Co., 120 E. Golden Gate Ave., Detroit 3, Mich. (Item 5)

Poison Ivy Cream

Zocreme is a new poison ivy cream that contains 20 per cent zirconium carbonate in a water soluble base. The product has been developed for the prevention of contact dermatitis especially caused by contact with poison ivy, oak and sumac.

It is also for the treatment of these dermatoses and is packaged either with two, one-oz. tubes per unit or six one-eighth-oz. tubes.

A. E. Halperin Co., Inc., 75 Northampton St., Boston 18. (Item 6)

Thermostatic Water Control

The "Hydroguard" is a thermostatic water control device for hospitals, factories, etc. It works on the same principle as the thermostat on a furnace or oven. By turning the single control dial, instead of the usual two to four valves, the bather

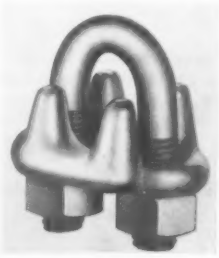
sets the exact water temperature desired. The unit automatically maintains that temperature. It instantly compensates for any drops or increases in water temperature. Failure of the cold water supply shuts off the shower, guarding the bather against excessive hot water.

The thermostatic principle is said to offer shower safety and save water.

Powers Regulator Co., Skokie, Ill. (Item 7)

Wire Rope Clips

These assemblies are drop-forged from high grade forging steel and are said to provide positive "grips of steel" for tough, heavy-duty service. The clips are engineered for safety, and the base channel is shaped to hold the wire rope secure without damage to individual strands. They can be applied on the job and no vise or other special tools are required.



The U-bolts, made of heavy steel, are protected against the formation of rust and corrosion by hot-dip galvanizing after threading. The threads are free running because no paint is used, and further protection is added by a green chromate coating which is applied after the galvanizing.

The ACCO clips are manufactured to secure wire ropes of various diameters.

American Chain & Cable Co., Inc., 929 Connecticut Ave., Bridgeport 2, Conn. (Item 8)

Explosion-Proof Signal Horn

This portable horn has an open-air audible range of 1,000 ft. and has been designed for use in industrial plants and where an explosion-proof signal horn is required.

The "Dual-Tone Signal Horn" creates a sound ranging from 116 to 120 db. and will blow continuously for more than a half hour or sound a minimum of 500 five-second warning blasts without recharging. The unit is powered by non-deteriorating and non-toxic Freon gas and provides signals for any industrial application despite possible electric power failures.

The horn consists of a standard 10-lb. cylinder of Freon 12 topped by two horns of slightly different

pitch. Operation is controlled either by a toggle valve or remote-type lanyard. The horns and control valves are protected by rigid steel guards and carrying handles.

Falcon Alarm Co., Inc., 243 Broad St., Summit, N. J. (Item 9)

Floor Maintainer

A new self-propelled, automatically-operated floor maintainer is said to reduce costs by cleaning 10 to 20 times faster than ordinary mopping.

The unit is electrically powered or is also available in propane and gasoline powered models. The sweeper is controlled by buttons and levers and automatically meters the solution to its twin brushes, scrubs, rinses, picks up dirt and solution, and dries all in one operation.

It is available with 26-in. or 30-in. brush spreads.

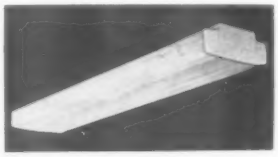
The unit maneuvers easily and the concealed cable reel gives clear vision ahead.

The clean water tank capacity is 20 gal. and the vacuum tank capacity is 18 gal. The solution control handle is mounted within the operator's easy reach and regulates a double discharge valve which meters the solution to each brush in equal amounts. The manufacturer says that the large model scrubs up to 28,000 sq. ft. per hour while the 26-in. unit scrubs up to 24,420 sq. ft. per hour.

Clarke Sanding Machine Co., Dept. PB, 30 E. Clay Ave., Muskegon, Mich. (Item 10)

Indoor Fluorescent Lighting

"Realite" is a twin-tube ceiling-attached luminaire that embodies total prismatic enclosure, called "Prismalume."



"Prismalume" is a molded element which controls light in all directions and provides a high level of downward light and an indirect component along the ceiling, while eliminating glare from the direct viewing zone.

"Realite" is a unit with shallow compactness that integrates with most modern architectural styles. The unit accommodates two F40T12/RS fluorescent lamps in each 4-ft. length. The unit comes in 4- and 8-foot lengths which, when ganged together, form continuous runs

without transverse supports interrupting the lines.

Locations for the unit are offices, stores, laboratories and industrial areas requiring high level illumination.

The enclosure possesses dimensional stability and is lightweight and shatter-free, an additional safety factor.

All metal parts are rust resisting and finished in a hot bonded white enamel.

Holophane Co., Inc., 342 Madison Ave., New York 17. (Item 11)

Butt-Snuffer

This all-steel ashtray is designed to be fastened permanently at eye-level to walls, posts or columns to encourage better housekeeping and cut down fire hazards resulting from carelessly tossed cigarette butts.

It is finished in fire engine red, and is easy to maintain. The tray may be filled with either oil ab-

sorbents or sand and cigarette butts can be sifted with a cleaning screen that is stored in a clip below the tray.

The "Butt-Snuffer" is available in two sizes: 8 in. x 5¼ in. x 6¾ in. and 14 in. x 7 in. x 8 in.

Safety Floor Products, 7711 Clyde Ave., Chicago 49. (Item 12)

Visual and Aural Signal For Control Systems

The SB-3 Signal Box for both visual and aural remote alarm indication and control systems may be used with any controlling equipment that actuates an electric relay or makes a contact upon appropriate predetermined conditions. The SB-3 flashes a green warning light for one condition, and a red warning light and bell at the other extreme of pre-set limitations of the system. If desired, the bell may be silenced by a front panel button on the signal box.

The unit may be operated as either a manual reset or automatic reset unit by means of an internal switch. In the manual reset position, the warning indication remains in operation until a reset button is depressed, regardless of correction in conditions of the systems. As an automatic reset unit, the SB-3 automatically stops the warning signals when conditions in the system are corrected.

A terminal strip is provided in the signal box for connecting additional warning devices in other locations.

Industrial Instruments, Inc., Cedar Grove, N. J. (Item 13)

Lift Truck Series

The 3,000-, 4,000-, and 5,000-lb. capacity models of this company's lift-trucks feature compactness, safety, automobile-like controls and greater operator comfort and speed of operation.

Trunnion steer wheels, short overall length and a short turning radius are also important features. The models stress safety with a long wheel base for added stability, low center of gravity, low seat height and the brakes are self-energizing in both directions with a total of 125 sq. in. of braking area.

Operator visibility is insured through interlocking rolled channel uprights with open-view. Full view controls, plenty of leg room and the low adjustable operator's seat mountable from either side also furnish added operating ease and comfort.

The load lifting speed of 48 fpm for the Model 50, and 50 fpm for the Models 30 and 40 are standard.

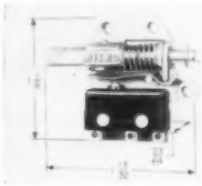
The pneumatic tires are 7.50 x 15 and the single unit frame and body are of heavy reinforced steel construction.

Hyster Co., 2902 N E. Clackamas St., Portland 8, Ore. (Item 14)

Door Interlock Switch

A sub-miniature door interlock switch, for use on radio, radar, x-ray and other hazardous high-frequency equipment cabinets has been developed. The switch (7AC1-T) is designed to cut off power automatically when a service door is opened. By pulling a rod actuator to the maintained contact position, it is possible to check circuits with the power on. The rod automatically returns to normal position when the door is closed. This eliminates the dangers of "tying down" conventional switches.

The basic switching element has fine silver contacts and a precision snap-action spring that provides long mechanical and electrical life. The contact arrangement is single-pole double-throw.



The total travel in either direction of the actuator plunger is approximately 5/32 in. The electrical rating is 5 amperes—125 or 250 volts a-c; 30 volts d-c (inductive or resistive) sea level—3 amperes, 50,000 ft.—2.5 amperes; maximum inrush—15 amperes.

Microswitch Division, Minneapolis-Honeywell Regulator Co., Freeport, Ill. (Item 15)

Corrosive Resistant Lightning Rods

These lightning rods have terminal sections of Monel nickel-copper alloy. The alloy resists corrosive stack gases where under normal conditions the high temperature of some industrial stacks melts off the lead covering of rods and exposes the copper. The copper rods are then attacked by the corrosive gases to the point where they are no longer safe conductors.

This is especially true where the rods are used on heavy-duty stacks such as those found in power, coke and gas plants and incinerators.

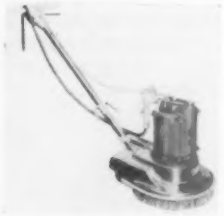
International Nickel Co., Inc., 67 Wall St., New York 5. (Item 16)

Explosion-Proof Floor Machine

This explosion-proof floor machine is designed for safety and operation in explosion or fire hazard areas. The machine features a switch mechanism that turns the machine off automatically when the operator releases the grip.

The switch is mounted in a sealed unit on the motor and is controlled remotely by a single lever on the handle.

The machine is equipped with a "Silent-Flo" power transmission and is available in two brush sizes—14 in. and 16 in.



Advance Floor Machine Co., 4100 Washington Ave., North Minneapolis 12, Minn. (Item 17)

Power Sweeper

This electrically powered sweeper has a three-speed forward transmission, plus one in reverse, and is said to make efficient sweeping possible under all conditions.

Model 605 E operates with two motors. One is for travel and one for power to brush and vacuum. This prevents a drain on the batteries when the sweeper is travelling to and from a job, and makes it possible for the sweeper to operate a normal 8-hour day without recharging.

The manufacturer states that since there are no fumes and noise, the model is suitable for modern air conditioned plants dealing with foods, chemicals, pharmaceuticals, etc.

This model is capable of sweeping up to 70,000 sq. ft. per hour in open areas and features "filter-vac" dust control which eliminates the need of emptying a dust bag. The dust is deposited in the main dirt hopper prior to entering the fan.

The 36 in. pick-up broom is mounted on self-aligning, sealed ball bearings and has pressure adjustment within reach of the operator for maximum sweeping under both heavy and light conditions.

Side brooms are available for either the left or right.

Wayne Manufacturing Co., 1201 Lexington Ave., Pomona, Calif. (Item 18)

Portable Underwater Floodlight

Firemen, rescue workers, etc., will find use for this portable underwater floodlight. It is equipped with a No. 1 photo flood lamp, and the 5¾ lb. unit provides illumination for seeing objects under 25 ft. or more of clear water.

Suitable for use under 100 ft. of water, the Type DIV floodlight measures 17 in. long and 13 in. across the reflector face. It is completely waterproof, and has a molded rubber body, cast aluminum reflector support, and polished aluminum

reflector. Its heat-resisting glass globe is protected by a specially plated steel wire guard. It requires 115-120 volt a.c. service.

Crouse-Hinds Co., Wolf and Seventh North Sts., Syracuse, N. Y. (Item 19)

Weatherproof Outlets and Switches

These weatherproof wiring devices are for outdoor installations or indoors wherever excessive moisture conditions exist. Featured in the weatherproof line is a new "Saf-T-Lok" snap-cover outlet which locks in the open position for easy one-hand insertion of plug. The hinge snap-cover never rests on the plug or wire and cannot damage the plug or insulation if the cord is jerked out suddenly.

Another item in the line is a weatherproof flush switch with a die-cast one-piece toggle lever for extra strength and durability. The two designs feature plates made of .040 solid brass, springs of stainless steel, and the rivets and screws are brass nickel plated.

Bell Electric Co., 1844 W. 21st St., Chicago 8. (Item 20)

Industrial Ambulance Vehicle

This vehicle has been used successfully as an in-plant ambulance vehicle.

Large industrial plants have found

that they are small enough to go directly into interior aisles and passages in production areas after an emergency occurs.

The model illustrated is the 1956 Ford "Memphian" Ambulette.

Memphis Coach Co., Inc., 2087 York Ave., P. O. Box 8093, Memphis 4, Tenn. (Item 21)

Window Platform

This window platform is for window washers, painters, glaziers and other window maintenance men. It collapses compactly for carrying from one window to another and can set up in a matter of seconds. It rests on the outside sill and is held firmly in position by means of an adjustable, telescopic steel tube on the inside. The guard rail is 34-in. high, provides security and saves time.

Industrial Products Co., 2850 N. Fourth St., Philadelphia 33. (Item 22)

Hospital Lights

These hospital-lites are made with spring-tension sockets and swivels and adjust to any position. Specifically designed for hospitals, most of the 14 different models include the manufacturers' Coolite Shade, a metal shade that remains cool and comfortable to the touch even after long hours of use with up to a 100-watt bulb.

Units for wall mounting are supplied with the "Sur-Mount" plate and maintenance is minimized by a method of electrical assembly wherein the components of the unit

can be connected and disconnected without disturbance to the electrical feed connections.

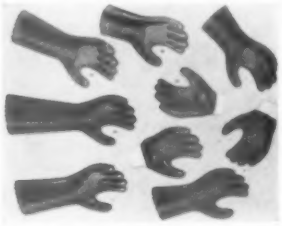
The line includes nine wall models, two floor models, two laboratory models and one model for attachment to a hospital bed.

Swivelier Co., Inc., Dept. HP, 43—34th St., Brooklyn 32 (Item 23)

Work Gloves

The "Pacemakers" are work gloves that are said to be flexible enough to meet most industrial hand protection needs.

Each glove in the line is made of neoprene coated flannel in three different weights: light, industrial and heavy-duty. In addition, there is a choice of knit wrist and 12-,



14½- and 18-in. gauntlet styles. The heavy-duty "Hot 'N Cold" glove features two 8-oz. shells, face-to-face napping for extra insulation, double-napped inner lining, bar-tacked fingertips and non-ravel lockstitch binding on the gauntlet. Light and industrial weight "Pacemakers" are available in black, and the heavy duty styles come in mahogany red with non-slip finish on the palms and fingers.

The gloves are recommended for any job where resistance to extreme abrasion and chemicals is important, and jobs where the gloves will encounter acids, caustics, solvents, greases or oils, and for handling lumber, wood, concrete, tile, etc.

Pioneer Rubber Co., 296 Tiffin Road, Willard, Ohio. (Item 24)

Radiation Meter

Model 640 low energy survey meter has been developed to ascertain the presence of dangerous quantities of x-rays generated in industrial plants and other locations

where high voltage equipment such as magnetrons, hydrogen thyratrons and betatron magnets are in use.

The instrument will measure very low energy x-rays with tolerance level intensities of as little as 6 milliroentgens per hr. According to the manufacturer, the instrument will measure low energy x-rays, low intensity x-rays, beta rays, beta and gamma rays in the presence of an intense radio frequency field.

The instrument has three sensitivity ranges of 10, 100 or 1,000 mr/hr., and two energy ranges of 8 to 50 Kev with mylar window in place and 50-2,000 Kev with cover plate.

In addition to measuring possible industrial health hazards, the 640 survey meter is suitable for both laboratory and production line use in checking television sets, and x-ray machines, such as fluoroscopes, spectrometers, etc.

Victoreen Instrument Co., 3800 Perkins Ave., Cleveland, Ohio. (Item 25)

Warning Flasher for Trucks

Flashing intermittent red warning signals and visible for one mile in all directions, the "Fyr-Fly" is designed especially for truckers. The inexpensive, flashing warning device offers truckers multiple usage both for safety protection and utility.

The unit has no connecting cords or wires and can be placed any distance from the truck to warn oncoming traffic. The device is ruggedly built and is rain, dust and explosion proof.

The "Fyr-Fly" is offered in kits containing a set of three "Fyr-Fly" warning lights, plus a companion piece called "Kandelite," a steady white utility light which may be used anywhere—around the car for motor trouble-shooting, flat tires or any desired place.

Both the "Fyr-Fly" and "Kandelite" operate on standard dry cell batteries and will operate in excess of 36 hours in continual use.

Pioneer Signalite Co., Division of Angelus Aircraft, Inc., 11300 Hindry Ave., Los Angeles. (Item 26)

Valve and Flange Cover

Two new lines of "Spray-Stop" covers, that prevent sudden leaks from jetting onto personnel and equipment have been developed. One is for valves and the other for flanges, and they are manufactured from Teflon for continuous high-temperature conditions up to a maximum working temperature of 500 F.

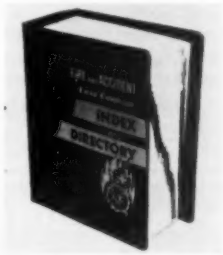
The Teflon-coated glass cloth covers are especially resistant to acids, caustics and many industrial chemicals and fluids. Teflon thread is used throughout the "Spray-Stops."

The fastening tapes of the new covers are constructed of a special glass weave that is treated with selected high-temperature resins. Eleven different sizes fit 95 per cent of all valves in standard industrial use. Special shapes and sizes of the valve and flange covers can, if necessary, be manufactured to specifications.

Neirad Industries, Inc., One Post Road, Darien, Conn. (Item 27)

Fire and Accident Control Information Service

A professional "Information Service" is now available for use in the fire and accident control field. This service covers the many problems connected with preventing or limiting loss from both fire and accidents.



This service includes an "Index and Directory" and a "Supplemental Service" which will be issued at six month intervals to keep the index and directory up-to-date. It will enable the user to quickly and easily locate information or data he may desire on the many phases of accident prevention and fire control.

The index and directory consist of three separate parts. First, there is an extensive "index" on subjects pertaining to fire and accident control. Under each is listed publications with information concerning the particular subject.

Second, it includes a "guide" that mentions the various considerations and preventive actions necessary.

Third, it contains a "directory" listing of thousands of publications referenced in the index and guide section, showing their availability, procurement source and price.

The index and directory consist of approximately 1,200 pages, and includes over 10,000 subjects and 50,000 references.

It is also extensively cross-referenced.

Loss Control Associates, 629 Oakmont Dr., Plattsmouth, Neb. (Item 28)

NEW PRODUCTS (Cont.)

Line Marker

Ultra-smooth surfaces may now be striped with this new traction grip paint spreader. This is a result of the tread imbedded in the all steel roller spreader. Particular uses will be such smooth surfaces as found in warehouses, garages, etc. The design is said to increase efficiency in laying down the line. The spreader uses the same principle as a printing press, rather than a brush or spray.

It is suitable for use in marking safety aisles, parking lots, warehouses and offices.

The machine is gravity fed and has no power unit, and throws off no dust spray. Receiving the paint from the gravity line, a distribution apron feeds it evenly to rollers which make the impression. The machines may be used on any surface such as black top, Macadam, concrete, asphalt or wood.

Industrial Equipment Co., 477 Ashford Ave., Ardsley, N. Y. (Item 29)

★ The Positive Ladder Safety Device

It locks automatically—instantly—holds.

SAFETY DEVICE FOR LADDERS

Prevents death and injuries from falling.

Automatic: Positive. Will catch workman if he starts to fall even if unconscious.
Inexpensive. Easy to install. No upkeep. Clamps to any rung ladders, peg ladders, pole or frame. No welding or cutting.
Simple to operate: Requires no attention from climber.
Notched rail **hot dipped galvanized.** Entire equipment rust and corrosion proof.
In use throughout country and abroad for approx. 8 years.

Patented. Manufactured only by

SAFETY TOWER LADDER CO.
1024 Burbank Blvd. P.O. Box 1052
BURBANK, CALIFORNIA

★ ★ ★ ★ ★ ★ ★ ★ ★

NEWS ITEMS

D. J. (Don) Wrigglesworth has rejoined the Gro-Cord Rubber Co., Lima, Ohio, in the special services department.

Mr. Wrigglesworth will be Industrial Sales promotion manager for the company. Gro-Cord specializes in the manufacture of soles and heels for work and safety shoes. He has had many years experience in specialized work in the safety shoe field.

* * *

John Douglas has been appointed Detroit District Representative for Jomac, Inc. of Philadelphia. The organization manufactures industrial work gloves.

He has been a salesman in the safety supply field for over 15 years.

* * *

W. P. Cornwell recently became sales manager of Wyandotte Chemicals Dallas district. He has been a Wyandotte sales representative in Pennsylvania and Colorado since

1945. In 1954 he was promoted to sales management, and has field experience with the application of Wyandotte products in a variety of industries.

New poison ivy ointment has both zirconium and antihistamine

Now Zircreme has an antihistamine additive to make this highly effective poison ivy ointment even better.

MSco A-20 Zircreme contains zirconium, the latest medically proved treatment for poisonous plant dermatitis. Zirconium is widely accepted by leading dermatologists in the medical profession. It is the newest approach to the poisonous plant hazard.

In combination with the curative properties of zirconium, the antihistamine pyrilamine maleate is now added to relieve itching caused by poison ivy, poison oak, and poison sumac. This is the first time this combination has ever been made available in the unit system of first aid for your workers' safety and comfort . . . another "MSco first." See your distributor or write for details. Medical Supply Company, Rockford, Illinois. In Canada, Safety Supply Company, Toronto 2.

Spooky Says:

"It's the landing that's rough — 'should have used an Auto-Crat Safety Belt!"

AUTO-CRAT MANUFACTURING COMPANY
A DIVISION OF THE B. N. CORPORATION
LOS ANGELES 39, CALIFORNIA

World's Oldest and Largest Manufacturer of Automotive and Airline Safety Belts.

Where you want nothing to grow

SS WEED-KILLER

Gets them fast
Gets them all
Keeps them off

Dolge SS WEED-KILLER is deadly to any weed it hits. After one application of this soil-sterilant, unwanted plant life can't even get started through the growing season. ...Safeguards parking lots, terraces, drives, gutters, sand traps and other areas against growth. . . . Reduces fire hazard close to industrial locations. . . . Finishes poison ivy, wild honeysuckle, bindweed, crabgrass. . . . Cuts ground maintenance costs drastically. . . . One gallon in solution treats 1250 square feet.

Write for free booklet. See your Dolge Service Man

DOLGE
WESTPORT, CONNECTICUT

"VEKI" SAFETY CAP

DESIGNED FOR GREATEST INDUSTRIAL SAFETY

VEKI's larger, roomier, elastic-type snood is designed specifically for enclosing more hair than any conventional type cap . . . full protection for all hair all the time! Front of twill. Back is made of mesh—can also be had in solid or flame-proof materials. Navy blue, and brown. Adjusts to all head sizes. Descriptive literature on request.

Manufacturers and distributors of a complete line of safety clothing and equipment.
Write Dept. NS-8 for information regarding your needs.

V. E. KENNEDY–INGALLS CO.
3735 NORTH 35TH STREET
MILWAUKEE 16, WISCONSIN

Foundry's Din

—From page 29

The outside of the hoppers was sprayed with a ⅛-in. coating of the rubber-base sound deadener.

Grinders. A special tool rest was designed with washers and pads installed between the rest and the grinder. A ⅛-in. thick washer was also installed between the wheel and its arbor. These washers are the same material used on the tumble barrel mountings.

Placing Castings Into Trays. This operation was quieted by coating the outside of the trays with the rubber-base sound deadener to a thickness of ¼ in. The bottoms of the trays are also covered with a two-inch layer of sand to aid in deadening the impact of the castings on the trays.

Over-all Noise Reverberation. Since the cleaning room is fairly small and has a relatively low ceiling, it was felt that installation of noise baffles overhead would reduce reverberation of noise from various operations in the room. Glass-fibered, plastic-lined sound absorbing baffles were hung on wires about eight ft. above the floor in approved patterns.

No single measure reduced over-all noise level more than a few decibels, excepting the installation of the overhead sound-absorbing baffles. The combined effect has produced significant results in making the cleaning room a much better place to work.

Research Pays

SINCE World War II the industries that have spent the most money on research and development have seen their profits grow most, while those that spent least on research, gained least. Of 11 industries studied over the years 1947-1953, the top three spent 5.7 per cent of sales on research and development and had a 52 per cent gain in profits; the middle three spent 0.9 per cent on research and had a 9 per cent gain in profits; and the lowest three spent 0.2 per cent on research, saw profits shrink 3 per cent.

—Lionel D. Edie in *Business Week*

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—SINGER'S *Patented** INSULATED GLOVE

A new kind of glove—so different it's patented—ideal on hot jobs that do not exceed 700 degrees. Made with three thicknesses of material: Outer layer of terry cloth, treated to make it flame-resistant; inner layer of all-wool for added insulation; third layer (next to skin) of soft, fleeced cotton. This combination gives flexibility and long wear.

In many cases it has replaced asbestos gloves at a big saving. Fine for extra warm welding jobs.

If not available from your safety equipment dealer, write us for complete information and prices.

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GLOVE MFG. CO.
860 W. WEED ST. CHICAGO 22
"Work Gloves That Sing"

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The Arabian American Oil Company has immediate job openings for qualified candidates for the following classifications:

SAFETY ENGINEER

With engineering degree plus minimum 5 years' experience in engineering and safety work.

SAFETY ENGINEER JR.

Recent engineering graduate with limited or no experience for company training program.

Salaries commensurate with experience and training. Liberal benefits program. Write outlining work experience and personal history.

Recruiting Supervisor, Box 125

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NEW YORK 22, NEW YORK

TRADE PUBLICATIONS

These trade publications will keep you up-to-the-minute on new developments in safety equipment and health products. All catalogs are free, and will be sent without obligation. Just circle publication number on the Reader Service Postcard.

1. Welding Fume Collectors: An 8-page bulletin describes and illustrates company's complete line of blast cleaning machines, dust filters and welding fume collectors. Application features are included. Ruenlin Manufacturing Co., 3885 N. Palmer St., Milwaukee, Wis.

2. Vision Screening: What vision screening of your employees can accomplish for your plant is described in this booklet. Details are included on how these tests produce 20 per cent reduction in spoilage, 45 per cent cut in training costs, and 14 per cent higher production for those plants who use them. Keystone View Co., Meadville, Pa.

3. Face Shields: Bulletin describes face shields that provide full eye, face and forehead protection plus full working freedom for your workers. Three different available sizes are discussed. B. F. McDonald Co., 5721 W. 96th St., Los Angeles 45, Calif.

4. Welders' Curtains: Bulletin describes company's line of welders' curtains and tarpaulins. Advantages of the Neoprene Impregnated Glass Cloth Curtains and Neoprene Impregnated Asbestos Tarps are featured along with details on the fire and accident prevention features. Standard Safety Equipment Co., 232 W. Ontario St., Chicago 10, Ill.

5. Non-Slip Surfacing Material: Catalog describes and illustrates "Safety Walk" a non-slip surfacing material that provides perfect traction even under water or grease. Application procedures are presented for stairways, ramps and runways. Minnesota Mining & Manufacturing Co., Dept. LB-36, St. Paul 6, Minn.

6. Safety Mirrors: Safety mirrors which provide the answer to dangerous blind corner problems in your plant or warehouse are presented in this bulletin. Bulletin lists different sizes available in both convex and flat styles. L. L. Brossard Co., 540 N. Michigan Ave., Chicago 11, Ill.

7. Foot Protection: Wooden soles that strap onto workers' shoes providing puncture-proof and insulating advantages are described and illustrated in this catalog. Also covered are several styles of safety shoes. Reece Wooden Sole Co., Columbus, Nebr.

8. Safety Signs: Catalog describes and illustrates signs and tags for accident prevention. The many types of signs are printed in the different colors available and with the many messages which can be imprinted over or under the main eye-catching word. Complete specifications and prices are also included. Standard Signs, Inc., 3190 E. 65th St., Cleveland 4, Ohio.

9. Tool Grinder: Safe tool grinding with "Coolant-Thru-The-Wheel" that directs the chips and ground particles into coolant vase is featured in this bulletin. Sharpens carbide, high-speed tools or general grinding. Scheer Co., Box 531, Statesville, N. C.

10. Skin Cleansers: Three skin cleansers—powdered, liquid and bar soap—are covered in this bulletin. Recommended applications for the different types of cleanser are included. Specific cleansing problems will be answered on request. Lightfoot Schultz Co., 380 Madison Ave., New York 17, N. Y.

11. Lighting Equipment: Protective portable lighting equipment which eliminates hazards of sparks or shock from broken bulbs (thereby reducing chance of fire) is described and illustrated in this catalog. McGill Manufacturing Co., Inc., 650 N. Campbell, Valparaiso, Ind.

12. Safety Shoes: Folder describes company's line of safety shoes with a built-in cushion to reduce fatigue and lessen the possibility of accidents. Nine styles are presented, with special features and prices. Holland-Racine Shoes, Inc., 386 W. 15th St., Holland, Mich.

13. Eye Protective Equipment: 12-page brochure describes and illustrates many styles and types of eye protective equipment. Featured is information on plastic lens for safety goggles. Watchmoket Optical Co., 232 W. Exchange St., Providence, R. I.

14. Folding Emergency Stretcher: Bulletin features a stretcher especially designed for first aid and emergency uses; as light, durable and folds compactly. Complete specifications included. Washington Products, 238 S. Fayette St., Washington, Ohio.

15. Floor Mats: Floor mats made of rubber and designed to combat excessive foot fatigue as well as to improve safety in standing, walking are described in this bulletin. Wear Proof Mat Co., 2156 W. Fulton St., Chicago, Ill.

16. Oxygen Unit: A portable compact oxygen unit which can be used by anyone to administer life-saving oxygen is described in this bulletin. The portable unit also performs resuscitation operations, according to the bulletin. Cycle-Flo Co., 983 Bridgeport Ave., Milford, Conn.

17. Portable Tool Mufflers: This manufacturer claims up to 75 per cent reduction in exhaust air noise

from the use of their exhaust mufflers on their screw drivers and nut setters. The mufflers are said to increase the acceptance of air tools and allow greater efficiency. Bulletin gives full details. Thor Power Tool Co., Aurora, Ill.

18. Industrial Safety Equipment: A general catalog on industrial safety equipment divided into four major sections: Eye Protection; Head Protection; Respirator Protection; and Welding is available. Illustrations, descriptions and ordering information included. Willson Products, Inc., 205 Washington St., Reading, Pa.

19. Remote Control System: Four-page brochure covers plug-in package remote control system for two-position discreet operation of starters, pumps, valves, loaders, gates, operators, etc. Describes system and techniques. Can be used with existing equipment or controls. Sparton Control Systems Division, The Sparks-Withington Co., Jackson, Mich.

20. Pipe Markers: A free planning kit shows you how and where to mark utility, process and supply lines. Shows you how to estimate costs, tells you how to write specifications, simplified check-list figures your marking needs. Working samples for testing also are included. W. H. Brady Co., 721 W. Glendale Ave., Milwaukee 12, Wis.

21. Hot Food and Liquid Carriers: Application of "Air Void" stainless steel vacuum-insulated food containers to speed mass feeding is described and illustrated in this brochure. How these portable hot food and liquid carriers can solve in-plant feeding problems is shown. Vacuum Can Co., 19 S. Hoyne Ave., Chicago 12, Ill.

22. Floor Grating: Safe load tables for all basic types of floor grating, paneled with constant charts, tables on standard grips and types of steel stair treads, types of grating anchors, use of gratings in several industrial industries, tables on bridge decking and various types of drain gates are all contained in this 16-page data and specification manual. Klemp Metal Grating Corp., 6601 S. Melvina Ave., Chicago 38, Ill.

23. "Breck Industrial Preparation": Booklet discusses industrial dermatitis and describes hand cleaner, Breck PH-7 Protective Cream, Water Resistant Cream, and Work Cream for use after exposure to degreasing material. John H. Breck, Inc., Springfield 3, Mass.

24. Safety Ladders: Safety ladders called "Stock-Step" mounted on ball bearing wheels for mobility, and which lock firmly to the floor with only seven pounds pressure to any stair, are described and illustrated in this brochure. Cramer Posture Chair Co., Inc., 1203 Charlotte St., Kansas City, Mo.

25. Protective Clothing: Catalog describes company's line of rubber safety products. Featured are: Gloves, aprons, sleeves, clothing, footwear, acid handling equipment. Miller Products Co., Inc., 29 Warren St., New York 7, N. Y.

26. Swivel-mounted Lights: Catalog illustrates a wide variety of "Localities" that are swivel-mounted for easy positioning as the work requires. Suitable models are included for benches, laboratories, machines, desks, etc. Fostoria Pressed Steel Corp., Fostoria, Ohio.

27. "What's New for the Laboratory": Among the new items illustrated and described in this 20-page issue are: A new Hevi-Duty Muffle Furnace, a new attachment for the Filamatic which permits dispensing metal-sensitive liquids without fear of contamination, new kimble and Corning glassware, a new adjustable speed stirrer, and evaporating dish and beaker made of Teflon, a new miniature temperature recorder, polyethylene pump, electronic thermometer, gas analysis unit for gas-liquid partition chromatography, variable speed rotating lab shaker, homogenizers, pipette washer and rinser, plus many other items. Scientific Glass Apparatus Co., Inc., Bloomfield, N. J.

28. Safety Equipment: 48-page catalog describes and illustrates company's line of welding accessories, helmets, shields, electrode holders, weld testing machines, hammers, and brushes. Fibre-Metal Products Co., Chester, Pa.

29. Radiation Detection: Literature describes a pocket-size radiation measuring device called Radiameter. No bigger than a camera, the Radiameter slips easily into your coat pocket, accurately monitors radiation energies from 1200 KEV down as low as 15 KEV, has two ranges; 0-25 MR/HR and O-1/HR. It operates on a single flashlight cell, weighs only two pounds. Electronics Division, Curtis-Wright Corp., Carlstadt, N. J.

30. Poster Frames: Glass-front poster frames are featured in this bulletin. The frames are suitable, according to the manufacturer's description for holding 8½" x 11" posters. Various styles are available. A. C. Davenport and Son, Inc., 311 N. Des Plaines St., Chicago, Ill.

31. Isle Markers: Literature describes Klear-Vu isle markers that are quickly and easily installed. The self-adhering backing requires only a light coat of adhesive to floor or pavement for a smooth, durable, non-shifting installation. The markers are unaffected by oil, grease, grime, salts, water or temperature changes and are made to withstand truck traffic. Lester Brossard Co., 540 N. Michigan Ave., Chicago 11, Ill.

32. "Limberoller" Belt Idler: Twelve-page, two-color booklet 2-C contains design and application data for those who select, specify, purchase and use belt conveyors to handle bulk materials. Included are descriptions, dimensional drawings, specification tables and suggested applications for "Limberoller" idlers and various troughing, impact, training and return brackets to use with belt widths of 18" through 72". Joy Manufacturing Co., 307 Oliver Bldg., Pittsburgh, Pa.

33. "Visualization Made Easier"—is the title of a new 20-page catalog describing the Chart-Pak method of making organization and flow charts, graphs, office and plant layouts. The method consists of "drawing" charts, graphs and layouts with pressure sensitive tapes and templates. Commonly recognized lines, shapes, bars, symbols and die cut office furniture templates are preprinted on tapes or sheets with adhesive backing. Chart-Pak, Inc., 100 Lincoln Ave., Stamford, Conn.

34. Fire Alarm Systems: An informative 10-page bulletin that serves as a guide for the preparation of fire alarm specifications is available. It is concerned primarily with systems that warn all occupants of the building being protected, such as would be installed in factories, hospitals, etc. The National Fire Protection Association code No. 72 Proprietary, Auxiliary, Remote Station and Local Protective Signaling Systems is discussed in detail as to its application to the above installations. Sections of these standards that concern systems to be specified are quoted verbatim and then explained in detail to provide a handy reference for those wishing to review recommendations in depth. Edwards Company, Inc., 90 Connecticut Ave., Norwalk, Conn.

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Opportunity for two experienced salesmen to join nationally known manufacturer and distributor of personal safety equipment in protected territories in Central Pennsylvania.

Line is well established and currently worked in this area.

Must be capable of earning over $10,000. Car provided and expenses.

Send resume to Box 419

NATIONAL SAFETY NEWS
425 N. Michigan Ave.
Chicago 11, Ill.

Injured's head can be securely immobilized with new stretcher

Here's another use for the versatile new Haggard's all-purpose stretcher kit. No matter what type of stretcher you now have, you have need for the new Haggard. It does all the things any stretcher can do, plus many more. It is a complete unit ready for instant use anywhere. It is so compact that it fits into a car trunk. Lightweight, only 28½ pounds complete with case, blanket, first aid supplies, and accessories. It's such a totally new concept in utility, versatility and practicality that you should investigate it at once. See how easy it is to store, transport, and put to use. See all the advanced, needed features that make it a combination litter, fracture board, traction splint, and resuscitator. Compact, convenient, complete. Ask your MSco distributor for a demonstration or write Medical Supply Company, Rockford, Illinois. In Canada, Safety Supply Company, Toronto 2.

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Put GRANET job-proven gloves to work in your plant, for complete hand protection *and* maximum wear per dollar. Palm coated or fully coated — with neoprene, rubber or plastic — for safe, sure grip. Types and styles specifically made for every job, from handling caustics to rough castings.

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. . . the Reader Service postcard will get it for you FAST!

Here's how it works—

Printed below are two identical Reader Service postcards—the bottom one for your use; the top one for later readers of this issue. The numbers listed on each card are keyed to product advertised and the new safety equipment and trade publications described on pages 132 through 141. Just circle the items you want to know more about, and we will ask the manufacturer to send you full information without obligation. Both cards are perforated for easy removal, and no postage is required.

New Safety Equipment

Products featured in this section have been carefully reviewed by Council engineers so as to bring you only what's new and reliable in the safety field. Only new safety and health products, or newsworthy improvements in existing equipment are eligible for listing.

Trade Publications

Here's a wealth of helpful trade literature — catalogs, spec sheets, booklets, brochures — that will help you compare before you buy. Whether you are in the market now, or think you may be at a later date, you'll want these valuable references in your safety equipment data file.

Products Advertised

As you read through this issue of the NEWS, you will find advertisements describing equipment that may help you solve some of your accident problems. Instead of making a "mental note," make sure you get full information by circling the corresponding page number on the Reader Service postcard. The letters L, R, T and B locate the ads on the page—left, right, top and bottom. IFC—inside front cover; IBC—inside back cover; BC—back cover.

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The advertising pages of the News

. . . your guide to reliable suppliers of worthwhile safety equipment

The advertising policy of the NEWS requires that all equipment and products meet established codes and standards, have the approval of recognized testing agencies, or have proven their value through actual use in industry. Council engineers and technicians screen every advertisement to make sure that product description is accurate, and performance claims verified by reliable sources. It should not be construed, however, that products advertised are approved or endorsed by the National Safety Council.

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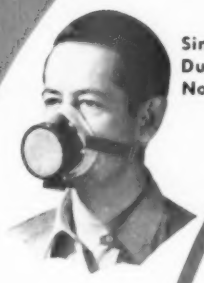

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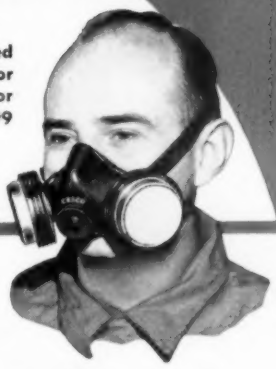

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A newly designed facepiece, with special attention to nasal contours, provides a snug, leak-proof fit with moderate headband tension. Dual headbands permit proper balance and adjustment for perfect seal along all facial contours.

Contact your nearest CESCO Distributor today for full information and prices on the complete line of respirators to meet every type of industrial requirement.

Approved
Dust Respirator
No. 94

Approved Dust
Respirator No. 96
with high filtration
and low breathing
resistance

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No. 600

Write for complete Catalog

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Light-duty Respirator
No. 81

CESCO C E S C O **FOR SAFETY**

HAND PROTECTION FOR WELDERS

AO "Drednaut" Welders' Gloves Provide Positive Hand Protection and Wearer Comfort

AO "Drednaut" Welders' Gloves are designed to provide the welder with increased hand protection and comfort. Made of specially chrome tanned cowhide, they give the welder maximum flexibility, heat resistance, and long wear. Only graded side splits are used, and they are selected for quality and uniformity of thickness. In field tests, this leather had practically no shrinkage on exposure up to 350° for 90 minutes.

All Gunn Pattern Gloves have wing thumbs which permit the gloves to follow the natural shape of the hands, thus reducing hand fatigue. The thumbs have only one seam for more comfortable gripping qualities. Seam at base of palm is double stitched and flat seamed for greater wearer comfort. Backs of Gunn Pattern Gloves are one piece with heavy lining.

There are six types of American Optical Drednaut Gloves to select from — two Clute patterns with double backs; three Gunn patterns with full one-piece backs; one Montpelier pattern with one-piece back, one-piece palm, all-welted seams.

SC5X163 GLOVE

Exceptionally resistant to heat — gives protection on heaviest gas welding and heaviest amperage electric welding. One-piece back and palm. Welted at all vulnerable seams for extra protection. Heavy lining on back. Overall length 14″.

Always insist on AO Trademarked Safety Products

American Optical
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